



United States
Department of
Agriculture

Forest Service

Northeastern Forest
Experiment Station

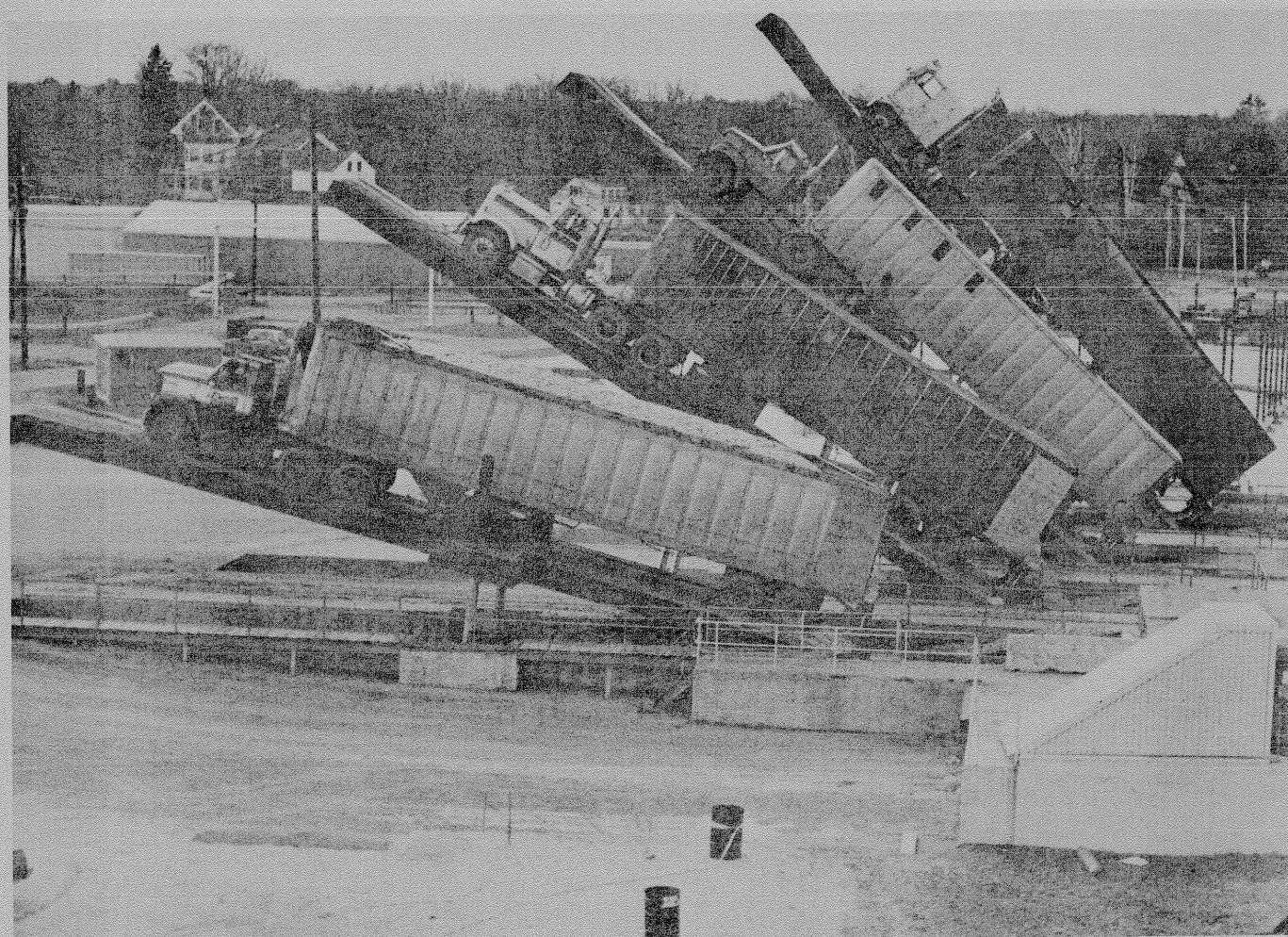
Resource Bulletin
NE-83

1985



Maine Timber Industries— A Periodic Assessment of Timber Output

Robert L. Nevel, Jr.
Peter R. Lammert
Richard H. Widmann



The Authors

Robert L. Nevel, Jr., forest products industry specialist, received a B.S. degree in forest technology from The Pennsylvania State University in 1965 and an M.F. degree in wood technology from Yale University in 1968. He then joined the Northeastern Forest Experiment Station's Forestry Sciences Laboratory at Princeton, West Virginia. In June 1978, he transferred to the Forest Inventory and Analysis unit, Broomall, Pennsylvania, where he is assigned to the timber removals group.

Peter R. Lammert, utilization and marketing forester, received his B.S. degree in forest utilization from the University of Maine in 1968. He worked in the private sector until 1976 when he joined the Maine Forest Service as Assistant Utilization Forester. In 1980 he assumed his present position with the organization.

Richard H. Widmann, forester, received his B.S. degree in forest management from the University of Missouri in 1975. He joined the Northeastern Forest Experiment Station's Forest Inventory and Analysis unit in 1978, where he is assigned to the timber removals group, Broomall, Pennsylvania.

Manuscript received for publication 13 June 1984.

Abstract

This periodic evaluation of statewide industrial timber output is based on a survey of the primary wood manufacturing plants located in Maine in 1981. It contains statistics on industrial timber harvest and plant wood receipts and on the production and disposition of the manufacturing residues for the year. The 438.7 million ft³ (12.4 million m³) of industrial roundwood produced in 1981 represented a 12 percent increase in production since 1970 when similar information was reported in detail. The production of sawlogs, pulpwood, and many other products increased during the period. Other trends in industrial product output and the use of manufacturing residue are presented along with 25 statistical tables.

Cover Photo

New technologies help Maine's timber products industry use more of the local resource; reduce the costs of labor, transportation, and handling; and increase efficiency in all segments of the industry. The pulpwood segment, devoted to supplying the state's huge pulp and paper industry, continues to use these new technologies wherever possible. The S. D. Warren Division of the Scott Paper Company at Westbrook, Maine, uses hydraulic truck dumpers to simultaneously unload manufacturing plant residue chips and whole-tree chips from four tractor trailers. The chips are then conveyed to the mill to make woodpulp and to fuel boilers to make steam for co-generation. The plant uses the steam from the co-generation process to generate electricity, to run electric- and steam-powered turbines, to heat the paper dryers and the plant, and to perform other pulp- and paper-making processes. Excess electricity is supplied to the local electric company (Scott Paper Company).

The use of trade, firm, or corporation names in this publication is for the information and convenience of the reader. Such use does not constitute an official endorsement or approval by the U.S. Department of Agriculture or the Forest Service of any product or service to the exclusion of others that may be suitable.

Maine Timber Industries— A Periodic Assessment of Timber Output

Contents

Highlights	1
Background	1
Timber Industry Trends—A Perspective	1
The Industrial Timber Harvest	5
The Lumber and Sawlog Segment	10
The Pulpwood Segment	13
Other Segments of the Timber Industry	16
The Veneer Log and Bolt Segment	16
The Turnery Bolt and Log Segment	17
Miscellaneous Segments	18
The Use of Manufacturing Residues	20
Literature References	22
Appendix	24
Definition of Terms	24
Harvest	24
Manufacture	24
Residues	24
Species	24
Index to Tables	25

Highlights

The 1981 timber industry survey in Maine showed that since 1970:

- Total timber output of industrial roundwood increased 12 percent to nearly 439 million ft³ (12.4 million m³).
- Sawlog production rose about one-third to nearly 794 million board feet (3.6 million m³).
- The total number of operating sawmills rose from 235 to 368.
- Production of all forms of pulpwood increased. Total pulpwood production rose 23 percent, reaching nearly 4.3 million cords (10.2 million m³). Production from roundwood rose by only 6 percent; the output of manufacturing plant residues for pulpwood increased by 3.5 times.
- Nearly all (98 percent) of the total available wood manufacturing residues were used. The total used for fuel nearly tripled.

Background

The Forest Service of the U.S. Department of Agriculture conducts continuing forest surveys of all states to provide up-to-date information about the timber and related resources of the Nation. In the 14-state region served by the Northeastern Forest Experiment Station, all states have now been surveyed at least three times. Maine has now been inventoried for the third time. The latest survey, conducted during 1980–82, included a timber-industry survey in 1982 to determine the output of timber products and the volume and disposition of primary wood-product manufacturing residues in Maine for 1981.

This report is a result of a 100 percent canvass of all primary wood-product manufacturers that were operating in Maine in 1981. Pulpwood production data were gathered as part of the Northeastern Station's annual survey of pulpwood producers in the Northeast. The State of Maine Department of Conservation, Forest Service Utilization and Marketing Division, assembled a list of all known primary wood-manufacturing firms in Maine for the canvass. The primary manufacturers were first contacted through a questionnaire mailed by the Maine Forest Service. Possible out-of-state consumers of Maine roundwood were also sent questionnaires. Any nonresponding manufacturer was sent an additional questionnaire or contacted by telephone by Maine Forest Service personnel.

This report deals mainly with statistics for 1981, the first year for a timber-industry canvass of this type. Statistics are given also for 1958 and 1970, the years of the previous surveys of the timber resources of Maine, which included information on the output of timber products supplied by the Maine Forest Service. Data for these years may not be representative for the various Maine timber industries covered in this report. When documented production statistics for individual timber products were available for previous or intervening years, they were included for comparison. Specific reference is made to statistics for other years from timber cut reports issued annually by the Maine Forest Service, and from other product and industry surveys conducted periodically throughout the 14-state region by the Northeastern Station.

Long-term production trends will be disclosed by repeated surveys in the future. Until a data base is built up over time, the reader is cautioned to use the current statistics prudently.

Timber Industry Trends— A Perspective

The harvesting and processing of timber in Maine have always been very important to the economic development of the state. With nearly 90 percent of the state's land covered with timber—more than any other state in the nation—these operations have provided income and timber products to the state's landowners and the nation's wood-using industries for more than 350 years—longer than any other major timber-producing state in the country. The following summary of the past literature is presented to put the current assessments in perspective.

Much of the importance of Maine's wood-using industries has been and will continue to be a result of the availability of timber-products from its forests. Nearly all of Maine's forests are classed as timberland,¹ and more of this forested land is owned by manufacturers of timber products than that in any other state in the country.

¹Timberland, formerly known as commercial forest land, is forest land able to produce crops of more than 20 cubic feet per acre per year of industrial wood and not withdrawn from timber utilization. Definitions of industrial wood and other terms used in this report relating to the timber-using industries are in the appendix.

The removal of timber products from the coast of the region now known as Maine began in 1602 and progressed sporadically until 1623 during the region's period of active exploration and the beginnings of settlements. In 1605, white pine samples were taken to England. In 1607, the first ship built in the New World by English-speaking people was constructed in Maine. For more than 250 years, timber products would be harvested in Maine to build thousands more ships. By 1855, when the United States had more ships than any other country, over half had been built in Maine.

Shipbuilding and the lumber industry grew in Maine—using large volumes of white pine, oak, and tamarack. Ships made from Maine's timber products carried lumber, timbers, shingles, and barrel staves made from Maine's round timber products throughout the world (Fig. 1). Although it is believed that Maine's first sawmill was built as early as 1623 and a second in 1631, the first recorded date is for a water-powered sawmill in 1634. During the colonial period, Maine dominated the lumber industry, especially after the close of the French and Indian War and the removal of the Indian threat. Throughout the remainder of the 18th century, lumbering increased quickly with settlement of the state. By the first part of the 19th century, more lumber—mostly white pine—was shipped from Bangor than any other world port. Even though Maine's production of lumber continued to increase throughout the 19th century, the state's dominance as a lumber producer began to wane as lumbering moved westward. By 1839, Maine had lost its status as a lumber producer to New York. By 1850, most of Maine's readily available white pine had been cut, and in the 1860's iron began to replace wood for shipbuilding. Even so, Maine remained among the top five lumber-producing states until 1869 when dominance in the lumber industry shifted to the Lake States.

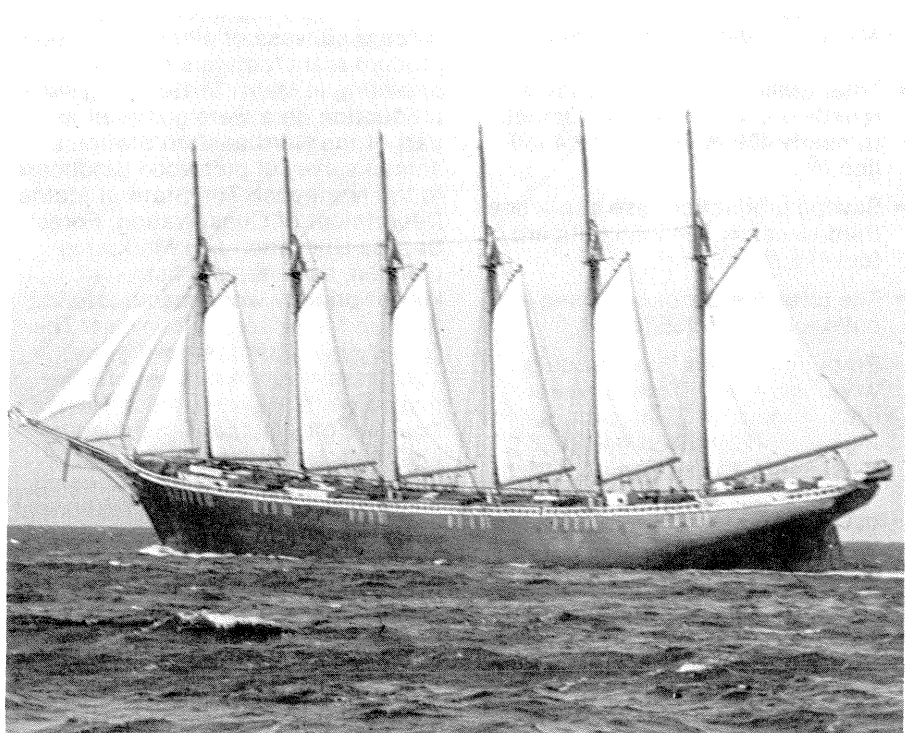


Figure 1.—The massive, six-masted “Wyoming” under sail. Built in 1909 at Bath, Maine, this was the largest wooden sailing vessel ever to carry cargo. (Maine Maritime Museum).

Along with the removal of timber products for lumber and other building materials, shipmasts, tannin, shingles, and cooperage, much timber harvesting and processing was associated with agriculture and the settlement of forested lands. Farming and land-clearing peaked between 1820 and 1880 when only three-fourths of Maine was forested. Much of the timber felled to clear land was piled and burned; the best was used for building and fencing materials, and large volumes of timber were harvested for fuel.

Until the early 1800's, timber harvesting and processing in the state were slow, tedious, and labor-intensive. Hand tools and animals were used in the woods and water-powered reciprocating saws in the

mills. Through most of the 1800's and into the early 1900's, the timber and other wood-using industries still managed to flourish with the expansion and development of other industry and better transportation in the state. Hardwood timber products were used by the iron, charcoal, chemical, mining, and railroad industries. Quality hardwood timber was used for farm implements, furniture, and tools. With the depletion of white pine and the advent of railroads and better roads, spruce and other softwoods and hardwoods were utilized more. The production of hardwood lumber began to rise, and softwood timber was cut in large volumes and carried over the rails or floated down rivers to supply an expanding pulp and paper industry as well as the still-vigorous lumber industry.

The introduction of steam-driven equipment increased productivity in the woods and at the mills. Steam-powered log-haulers and trains hauled sawlogs, lumber, pulpwood, and woodpulp to market. Steam was used to power circular and gang-type saws and in pulping and paper-making processes. Maine's lumber production peaked in the early 1900's, eventually consuming less of the state's timber than the pulp and paper industry. In 1868, wood was used in Maine for the first time to make paper. By 1880, the pulp and paper industry was well established in Maine, and by 1890, the state led the nation in the production of wood-pulp—producing nearly one-fourth of the national output.

Except for the practices of cutting pulpwood into shorter lengths and peeling it in the woods, the harvesting technology, the major timber products, and the markets for the products remained much the same throughout the first quarter of the 20th century. The demand for Maine's timber products reached a low during the 1930's depression, and remained low until World War II. Demand for most of Maine's timber products peaked again after the return to peacetime. In 1946, lumber production in the state exceeded that in each of the five states—Indiana, Michigan, New York, Pennsylvania, and Wisconsin—that had produced more than Maine in 1869. Stability came to Maine's timber and timber products industry during the 1950's and 1960's with the return to normal economic conditions and the rising importance of pulp and paper to the industry. The manufacture of pulp and paper became Maine's largest single industry during the late 1950's and early 1960's—a period Coolidge (1963) referred to as "the paper age." The industry has maintained this status through the present. Except for minor fluctuations as a result of occasional periods of recession, Maine's production of woodpulp and lumber have continued to increase during the last quarter century, and most other segments of the state's timber products industry have grown or remained stable.

Since the 1950's, the number of most types of wood-using facilities has diminished, but the remaining mills have provided a solid industrial base through increased capacities and production and better use of the timber resource. This has been accomplished primarily by the timber industry's expansion of present facilities, its use of improved technology, and its adaptation to changes in timber resource, product demand, and transportation systems. The industry has adapted well to technological improvements in logging and manufacturing operations; novel and better transportation methods; stronger demand for new and traditional products; changing bark, pulpwood, and fuelwood markets; and concerns over energy and environment. The result has been greater efficiency, increased productivity and production, energy cost savings, and better use of the timber resource and of manufacturing residues for old and new products.

Examples of the Maine timber industry's recent adaptation to economic opportunities and new technology include the harvesting, hauling, and utilization of tree-length material by both pulpmills and sawmills, as well as other advances. Advanced pulping technology utilizes hardwoods, wood-manufacturing residue, and total tree chips. More dimension lumber is manufactured from spruce, fir, and hemlock. Sawmills employ computerized log breakdown and recovery machinery to sort and process large numbers of small-diameter logs. The sawmills use automated machines to sort and bundle lumber by width and grade. Lumber is treated to prevent staining. Waferboard is made from large, wood chips or "flakes" to compete with plywood and other particleboard construction products. Insect-infested spruce and fir timber is sprayed and salvaged. Trees are processed into chips in the woods. Short- and tree-length timber products are transported by barges and by specialized rail and trucking methods in place of the environmentally unacceptable log drives down rivers (Figs. 2 and 3).

A lumber-grading association was formed in Maine to gain markets previously supplied with Southern or Western lumber. Mills have installed debarkers, chippers, and wood-burning power plants to utilize chips and wood by-products for fiber and fuel. Some manufacturers have diversified their product line; merged with local, regional, or national enterprises; or entered new market areas. Maine now has several waferboard plants, four "stud mills" sawing stud material from tree-length logs, three of the Nation's four wooden-clothespin manufacturers, and the largest sawmill complex east of the Mississippi River. Industry has responded to fluctuating export demand, and exchange rates, and proximity to the Canadian border, by exporting steady volumes of sawlogs and veneer logs. The timber industry's adaptability to changing circumstances and its ability to capitalize on recent economic opportunities show its strength and its potential for continued growth and development.

The future of Maine's timber industry will continue to affect and be affected by the state's timber resource and economy. The major challenges to the state's largest industry are controlling costs, improving productivity, and more intensive management of smaller diameter softwoods to continue supplying timber products to Canada, the Northeast, and its own state when the spruce-budworm infestation is abated.

Irland² feels that the northeastern reconstituted-wood panel boom is "... one of the most vivid bursts of new mill investment in the postwar history ... of the national wood-using industry and that the region is undergoing a ... resurgence as a major forest products region. ... " The reconstituted-wood panel industry, which

²Irland, Lloyd C. An update on reconstituted wood panels in New England. Unpublished paper presented at the Northeast fall section meeting of the Forest Products Research Society, West Lebanon, NH, Nov. 3, 1982.

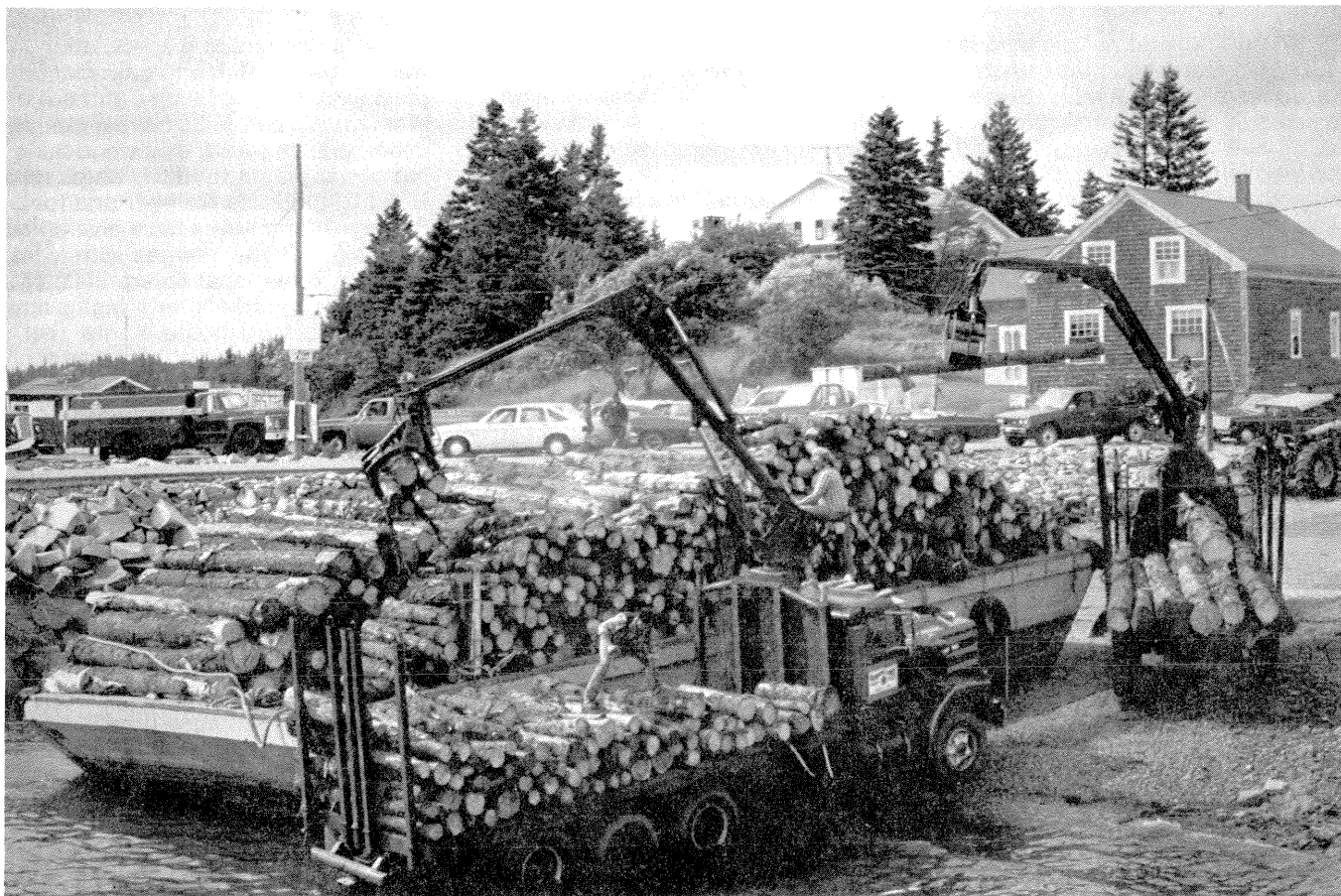


Figure 2.—Water still plays a part in transporting roundwood in Maine, although the river drives are gone. Here, red spruce sawlogs and pulpwood from islands in Penobscot Bay are sorted and transferred from a barge to modern trucks at St. George. (Philip Conkling).

includes the waferboard segment, can make flexible use of Maine's large, under-utilized timber resource of aspen, dead and dying fir and spruce, and low-grade hardwoods (Irland 1981).

The outlook for the timber industry of Maine is, for the most part, an encouraging one. The industry continues to grow in its major segments, remains stable or exhibits growth in most others, and is currently exhibiting its traditional adaptability and resourcefulness in using the available timber resource. Few of the industry's segments should show

decline over the next decade if they remain aggressive and quick to adapt to some difficult challenges that lie ahead. The various segments must reckon with the spruce-fir supply and demand,³ the effect of the budworm, the diminishing availability of yellow-birch veneer-quality logs, and develop markets to utilize the abundant lower grade hardwood resource. In so doing, with an improved national economy, there should be sustained growth in the lumber and woodpulp segments, growth in the new wood-panel industry, and growth or stability in the veneer segment to supply face veneer to the panel and housing industries.

The turnery industry may be expected to grow as technology is developed to utilize the abundant, lower quality hardwood resource that is presently considered unsuitable for turned products. The wooden clothespin segment may be struggling to survive as a result of recent removal of the 1979 Federal trade barriers on imported clothespins.

³Readers interested in studying the spruce-fir supply and demand are encouraged to read the analysis by the Maine Forest Service listed at the end of this paper.

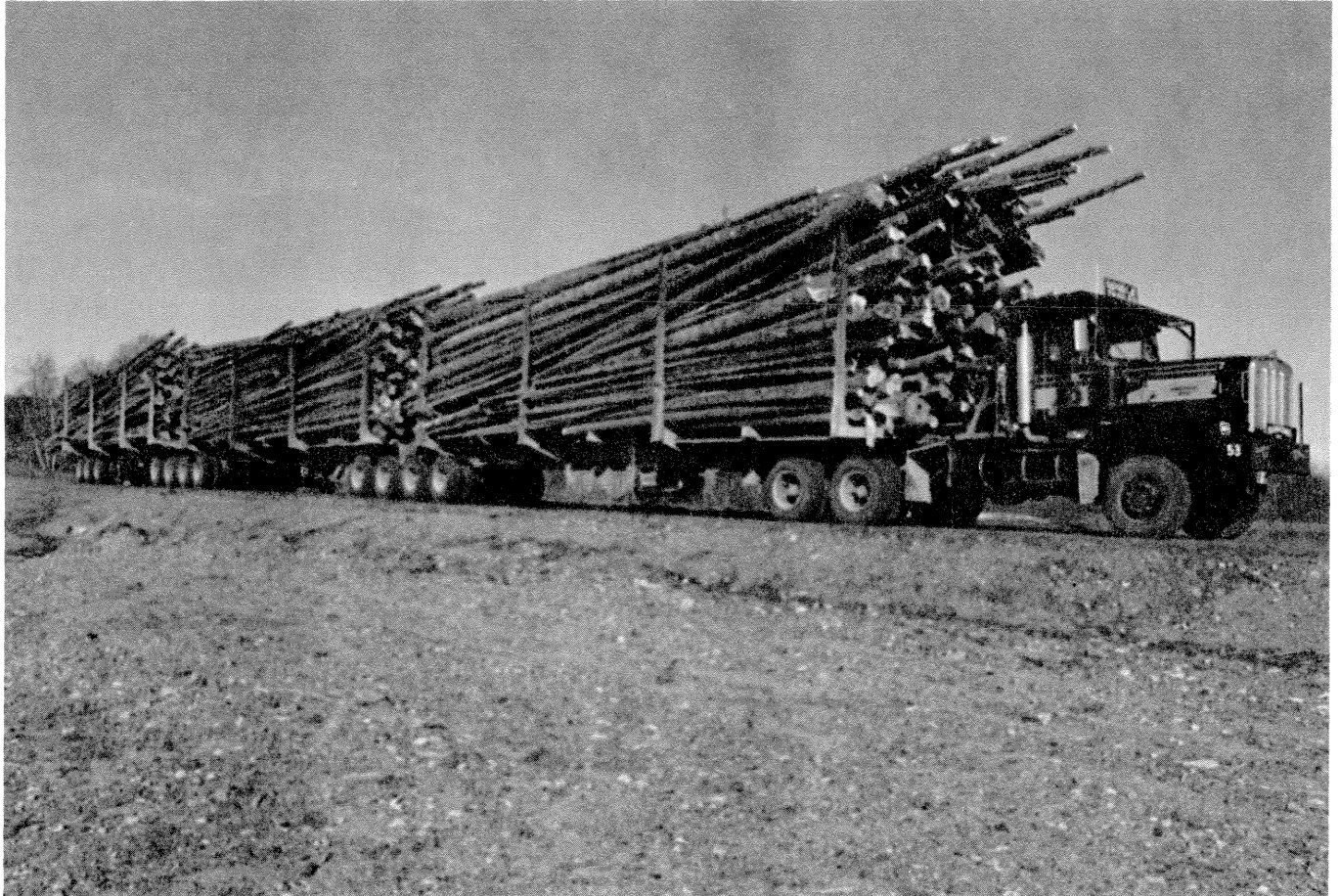


Figure 3.—Recently, a record-breaking load of tree-length logs was hauled experimentally on Great Northern Paper Company's Golden Road in northern Maine. The 79.5 cords, weighing 187 tons, were hauled on a three-trailer truck, 160 feet long with 14 axles and 54 tires. Everyday, 24 hours a day, two-trailer trucks haul wood over this part of the company's private road system designed for movement of these massive loads. (H. O. Bouchard Transport, Inc.).

The Industrial Timber Harvest

Annually, Maine's forests supply the timber-using industry with more industrial roundwood products than any of the 14 states in the Northeast. In 1981, the industrial timber harvest amounted to 439 million ft³ (12.4 million m³) of roundwood products. According to the USDA Forest Service's most recent timber-industry surveys, this volume exceeds the combined annual timber harvest of the three next largest timber-producing states

—Kentucky, New York, and Pennsylvania—in the region.

Softwoods accounted for 71 percent of the timber harvested in Maine in 1981. Almost all of the timber was used for pulpwood and sawlogs. More than twice as much of the timber harvested went into pulpwood as went into sawlogs. Pulpwood made up two-thirds of the total harvest, 60 percent of the softwoods harvested, and over

four-fifths of the hardwoods. Sawlogs accounted for nearly three-tenths of the total harvest, and most of the remaining softwood harvest. All other roundwood products, such as logs and bolts for cooperage, veneer, and turnstock, cabin logs, poles, posts, shingles, and stock for fencing, bowls, handles, and dowels, and numerous other miscellaneous items, made up only 5 percent of the timber harvest.

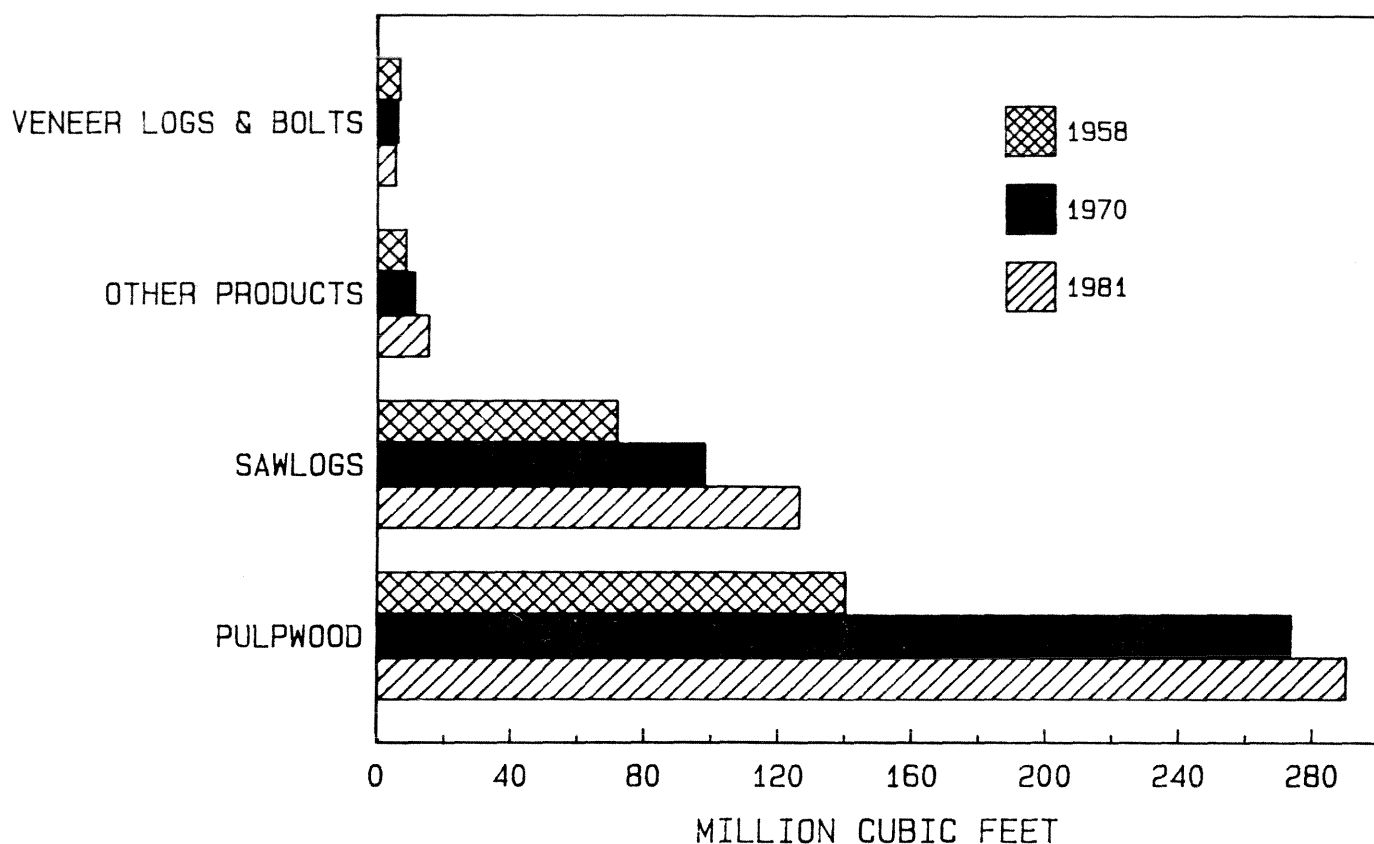


Figure 4.—Trend in industrial timber harvest in Maine for 1958, 1970, and 1981, by product use.

The industrial timber harvest in Maine has increased since the two earlier inventories of the state's forest resources in 1958 and 1970 (Fig. 4). The harvest increased by 161 million ft³ (4.6 million m³) since 1958 and by 48.6 million ft³ (1.4 million m³) since 1970. The two major timber products—pulpwood and sawlogs—were primarily responsible for the near doubling in harvested timber since 1958. Between 1958 and 1970, the timber harvest rose by 70 percent, and by 12 percent between 1970 and 1981. Slight declines in the cubic-foot volume of timber harvested for veneer

logs continued to occur through both periods, while overall, about one-third more timber was cut during each period for veneer logs and the other products as a group. Between 1970 and 1981 this situation occurred because, although the timber cut for turnery and veneer logs and bolts registered a slight decline in cubic-foot volume during the period, the harvest for the remaining miscellaneous products, such as cabin logs, fence stock, poles, posts, shingles and dimension stock, more than doubled (Table 2).

Since 1951, when the Maine Forest Service began its current series of timber cut reports, the total timber harvest and the harvest of both hardwoods and softwoods for the major industrial products have increased substantially (Figs. 5–7 and Table 3). When our present survey of Maine's timber industry was conducted for 1981, the annual harvest of industrial timber products was the highest it had been for the state since reaching a low point during the 1930's depression. Between 1951 and 1981, the timber harvest had increased by 65 percent, or 172.3 million ft³.

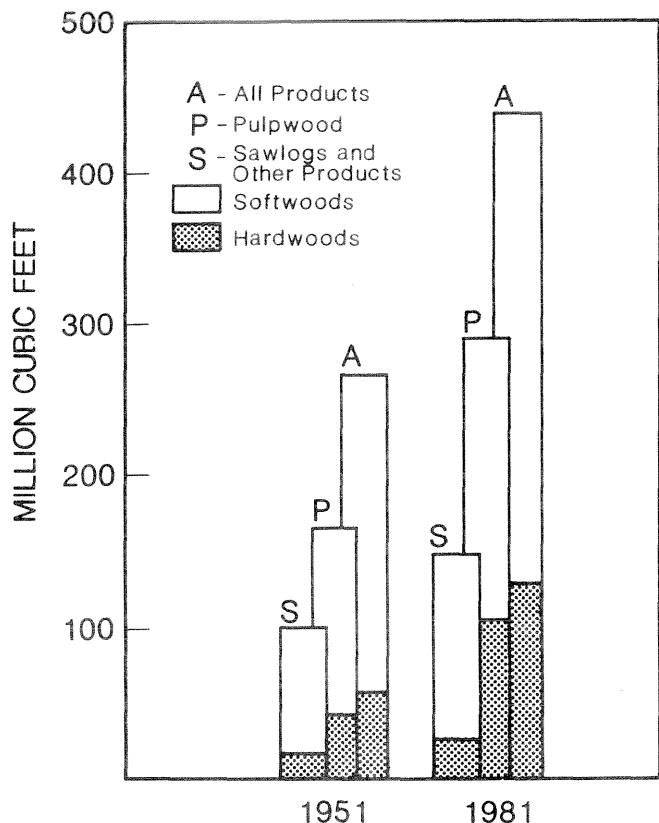


Figure 5.—Industrial timber harvest in Maine in 1951 and 1981, by major product use and species group.

The major demand on Maine's forests since 1951 has been to supply the woodpulp industry, and the trend in the state's industrial timber harvest has followed closely the pulpwood cut. For more than 30 years, softwoods have made up between 70 and 80 percent of the annual timber harvest—most of which was cut for pulpwood—and pulpwood accounts for between 60 and 70 percent of the annual harvest. Changes and fluctuations in Maine's harvest since 1951 have resulted primarily from the effects of economic and technological changes upon the woodpulp industry.

Following the depression, the annual timber harvest reached a 30-

year peak in 1956 prior to a recession which began in 1957. The harvest remained low throughout 1957 and 1958 as pulpmills consumed the accumulated woodyard inventories and as the mills continued to use more chipped wood manufacturing residues to make woodpulp. Total timber harvest dropped severely again in 1975 as another deep recession reduced the demand for woodpulp, though the state's harvest of sawlogs and other products continued to increase. Advances in pulping technology, making the manufacture of woodpulp from hardwoods feasible and practical, greatly enhanced the use of Maine's hardwood resource between 1951 and 1981.

The volume of hardwoods harvested in the state rose by 133 percent, or 73.2 million ft³, since 1951. Nearly 64 million ft³ of this increased harvest was in the form of pulpwood, which exceeded the increase in softwood pulpwood by 3.6 million ft³ and dwarfed the net increase of 9.6 million ft³ of hardwoods for sawlogs and other products. Between 1958 and 1981, the hardwood harvest in Maine doubled, and both the softwood and the total harvest nearly doubled. Gains in the hardwood harvests between 1958 and 1970, and between 1970 and 1981, were due to increases in the harvests of hardwoods for pulpwood. The use of hardwoods for sawlogs and other products decreased during these periods after more than doubling between 1951 and 1958. The increased use of hardwoods has become more responsible for the increases in Maine's timber harvests. Hardwoods accounted for only about one-fourth of the gain in the state's total harvest between 1958 and 1970, but nearly half of the gain in the total between 1970 and 1981.

Between 1951 and 1981, the softwood harvest rose by nearly 100 million ft³, or 47 percent. The rise in the softwood harvest accounted for nearly 60 percent of the increase in the state's timber harvest for the period. Most of the rise in the softwood harvest was due to an overall increase in the softwood pulpwood harvest for the past 31 years. During the period, declines in the softwood harvest in 1958 and in 1975 were brought about by decreased demand for pulpwood during the recessions. As the woodpulp industry has continued to use more hardwoods and chipped residues, its preponderant use of softwoods has declined. The rise in the softwood harvest in recent years has been due increasingly more to increased harvest of softwoods for sawlogs and other products. Even so, the softwood portion of the total harvest has declined.

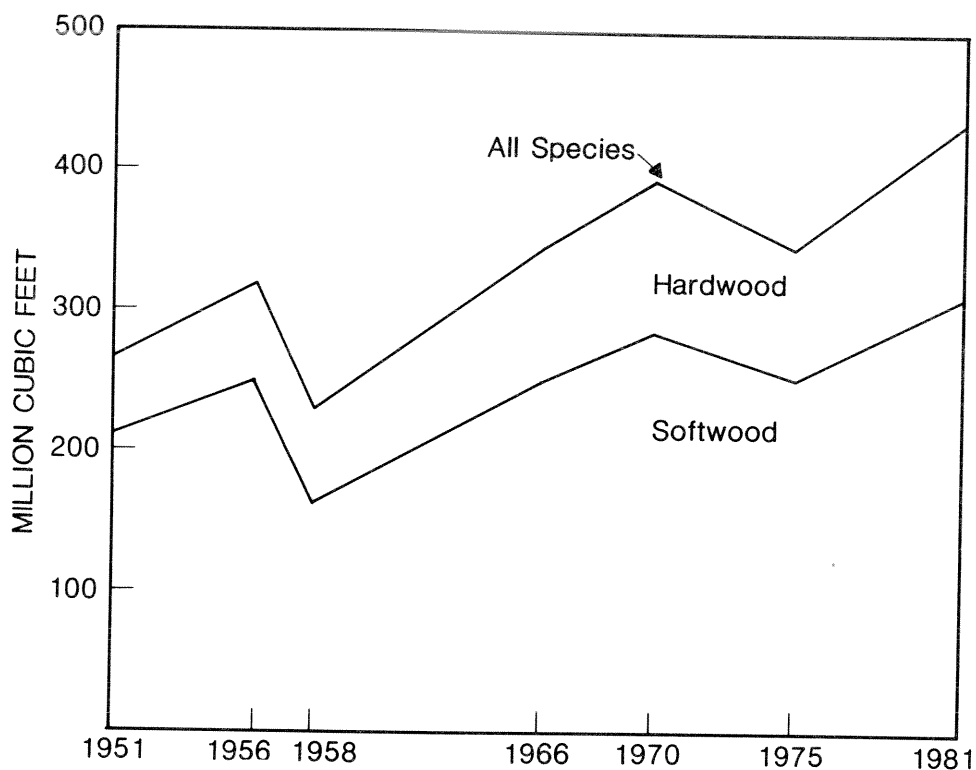
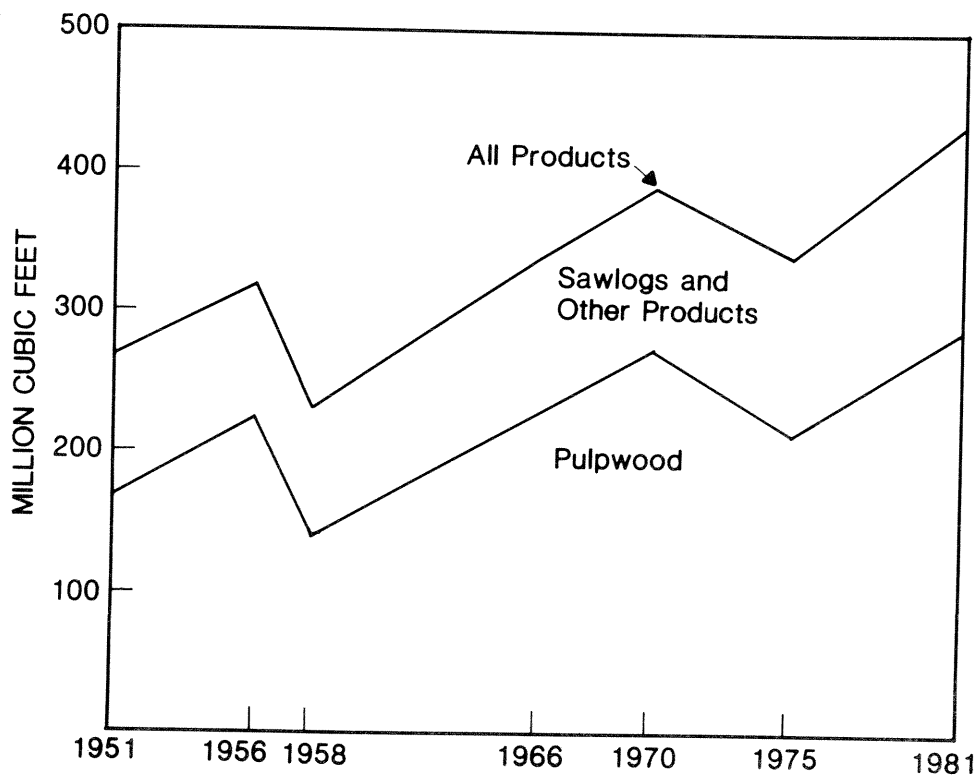


Figure 7.—Trend in industrial timber harvest in Maine for selected years, by major product use.



From 1958 to 1970, when the harvest of softwood pulpwood peaked, pulpwood still accounted for most of the softwood harvest. Between 1970 and 1981, the total softwood harvest rose while the softwood pulpwood harvest declined. In 1951, softwoods accounted for 79 percent of Maine's timber harvest. Since 1958, the portion has been about 7 percent less.

The bulk of Maine's timber harvest has always been in the form of sawlogs and pulpwood. Although the harvest, and the product and species mix for these and the other products from Maine's forests have changed in recent years (Fig. 4 and Table 2), sawlogs and pulpwood accounted for the same portion of the timber harvest in 1981 as they did in 1970 (Fig. 5).

The harvests of both pulpwood and sawlogs rose during the 1958-70 period and the 1970-81 period. By 1981, the pulpwood harvest was more than twice that for 1958, and sawlog production had nearly doubled. Between 1958 and 1970, the pulpwood cut increased considerably more than sawlog production, both in terms of volume and percentage of the total harvest (Fig. 4). Since 1970, the sawlog harvest increased most in both respects (Figs. 4 and 8). Between 1958 and 1970, the production of roundwood pulpwood nearly doubled, increasing only slightly since 1970. The output of sawlogs rose by about a

third during each period. In 1970, the pulpwood harvest was 274 million ft³, nearly triple the sawlog volume, and accounted for 70 percent of the state's total harvest. By 1981, the pulpwood cut had risen to over 290 million ft³, but represented 4 percent less of the total harvest that year. The sawlog cut rose by 28 million ft³, or 4 percent more of the total harvest. The share of the total harvest for all other products remained unchanged at 5 percent for the period as the volume rose by 3.5 million ft³.

Softwoods have always made up the bulk of the output of timber products in Maine. In 1951, softwoods accounted for about four-fifths of the harvest. Since 1958, the proportion of softwoods has remained around 73 percent while considerable change has occurred in the distribution of the softwoods and hardwoods among the various products. In recent years, proportionately less has been used for pulpwood and more for sawlogs, veneer logs, and other products, though the softwood harvests have increased for most years. As late as 1970, nearly 70 percent of the total softwood volume went into pulpwood; by 1981 the pulpwood portion had dropped to 60 percent.

During the 1970 to 1981 period, the output of softwood products in Maine increased 9 percent, from 284 to 310 million ft³. This was almost en-

tirely due to increased softwood sawlog production. The softwood sawlog harvest rose by over 40 percent or 34 million ft³, to 117 million ft³. In 1970, softwoods accounted for 84 percent of the sawlogs produced in the state; 11 years later, the softwood share had risen by 8 percent. About 1.2 million ft³ of softwood veneer logs were cut in 1981, as opposed to almost none in 1970, and the output of miscellaneous softwood products rose 1.4 million ft³. The production of softwood pulpwood dropped by about 10.3 million ft³ to 187 million ft³.

Twenty-one percent more hardwood was used in 1981 than in 1970—over 128 million ft³, up by 22 million—resulting primarily from the 27 million ft³ rise in the hardwood pulpwood harvest. In 1970, 72 percent of the hardwood harvest was in the form of pulpwood; by 1981 the pulpwood portion accounted for over 80 percent. Drops of nearly 6 million ft³ and more than 2 million ft³ occurred in hardwood sawlogs and veneer logs, respectively. Nearly 3.5 million ft³ of hardwoods were cut for other products in 1981, as opposed to less than 50,000 ft³ in 1970.

Two-thirds of both the total timber harvest and the roundwood pulpwood cut in Maine in 1981 was from four of the state's nine geographic units—Aroostook County, Piscataquis County, Somerset County, and the

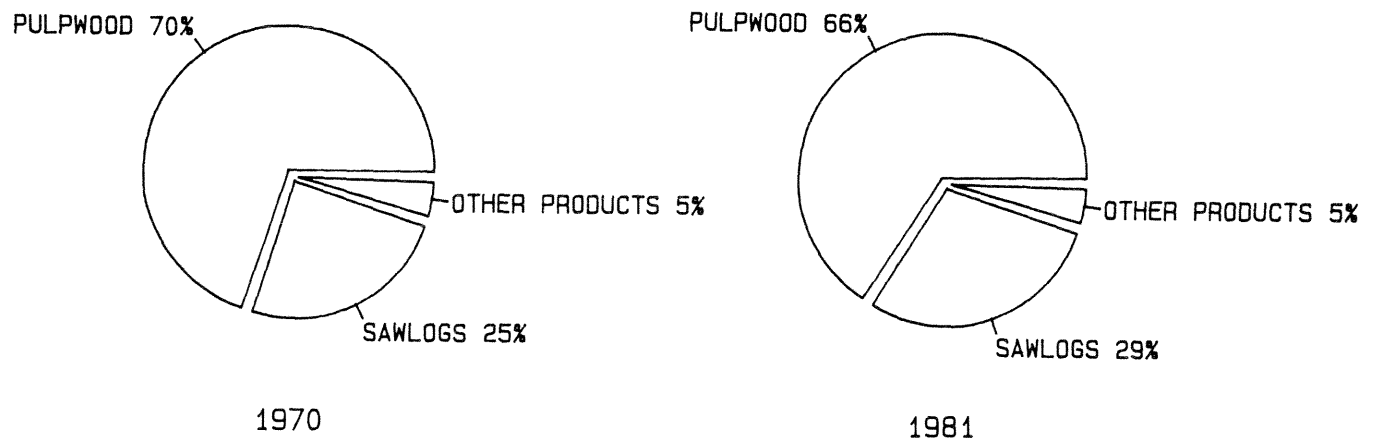


Figure 8.—Maine industrial timber harvest in 1970 and 1981, by product use, in percent.

Western Maine counties of Franklin and Oxford (Fig. 9). Each of these four units accounted for between 14 and 23 percent of the total output and about one-sixth of the pulpwood cut:

Geographic unit	Total harvest	Pulpwood	Sawlogs
	----- (Million ft ³) -----		
Aroostook County	99.2	51.1	43.8
Capital Region	26.5	18.5	6.9
Casco Bay	22.7	9.9	11.8
Hancock County	13.0	6.7	5.8
Penobscot County	46.6	34.1	9.7
Piscataquis County	63.7	50.0	12.2
Somerset County	60.3	49.4	7.8
Washington County	36.7	23.9	10.7
Western Maine	70.0	46.9	17.9
Total	438.7	290.5	126.6

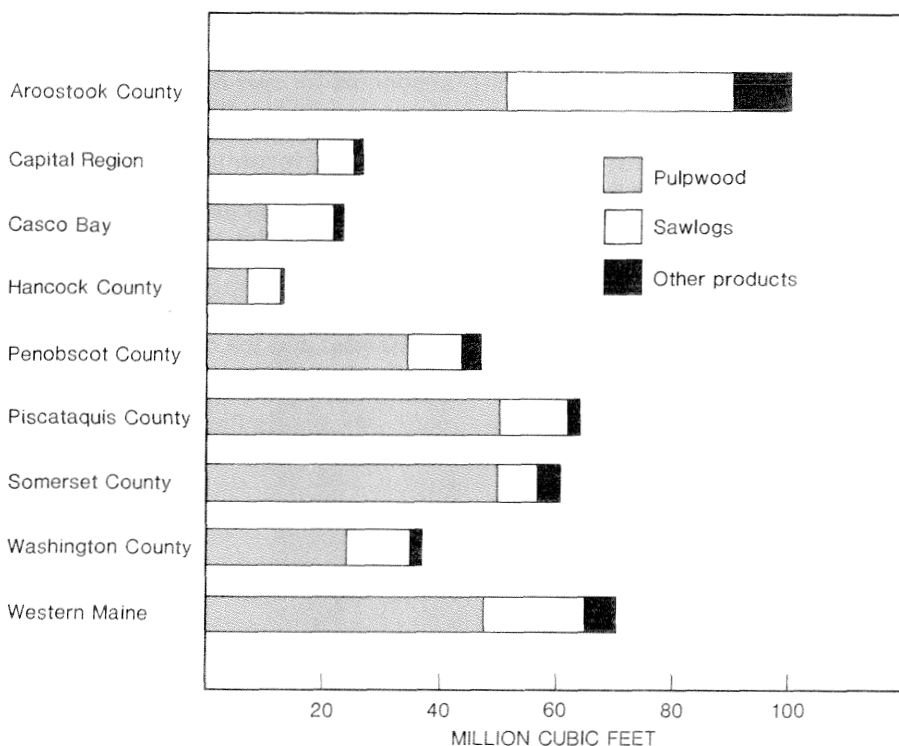


Figure 9.—Harvest of industrial timber in Maine in 1981, by geographic unit and major products.

In 1981, more of Maine's total timber products output and the output of all products came from Aroostook County than any other county or unit in state. Aroostook County supplied nearly one-fourth of Maine's timber products and over one-third of the state's sawlogs. Over half of the county's timber output was pulpwood and nearly half was sawlogs. The other units each produced less than one-seventh of the state's sawlogs. Although Western Maine was the next largest timber-harvesting unit, its total products output and its sawlog production were only 70 and 41 percent, respectively, as large as Aroostook's, and less than one-fifth of the state totals.

Aroostook and Western Maine also were responsible for more of the other products than any other county or unit—with each contributing more than 20 percent of the state's total—followed by Penobscot and Somerset counties. Somerset and Piscataquis were next in terms of the total harvest—each accounting for less than one-sixth of the state's total.

The Lumber and Sawlog Segment

Maine has been an important lumber-producing state since colonial days, supplying lumber, planking, and other sawn products for the construction of ships and buildings both here and abroad. Production was most likely limited to a few million board feet per year until Maine's population increased after the French and Indian War (Coolidge 1963). It was not until after the Revolutionary War and the War of 1812, however, that lumber production and the number of sawmills rose substantially with the continued settlement of the state. Coolidge states: "Lumbering during this period increased at a tremendous rate."

Production statistics for lumber and related products prior to the mid-1850's are either obscure or nonexistent. The earliest estimates (Coolidge 1963, Steer 1948) show the annual lumber production for the state increasing from about 539 million board feet in 1849 to about 785 million board feet by 1899. The lumber industry in Maine was at its height and continued to grow into the early 1900's.

Throughout this century, Maine has continued to be one of the leading lumber-producing states in the Northeast and in the Nation, despite major swings in annual lumber production and in number of sawmills (Fig. 10). Both lumber production and the number of sawmills in Maine peaked in 1909 at the end of the most productive period in the state and in the Northeast. Nearly 1,200 Maine

sawmills produced over 1.1 billion board feet of lumber that year.

Both lumber production and the number of sawmills plunged over the next 25 years with the depletion of the easily accessible forests and the increased importance of pulpwood to the state's timber industry. As the Nation's economy collapsed between 1929 and 1933, Maine lumber production and sawmill numbers hit bottom. In 1932 and 1933, slightly more than 100 million board feet of lumber were produced annually by 150 to 200 operating sawmills. In a quarter of a century, the lumber industry in Maine, as in the rest of the Northeast, had almost ceased to exist. Lumber production had dropped by more than 90 percent, and the number of operating sawmills had dropped by more than 80 percent. These trends were representative of similar changes occur-

ring throughout the Northeast as the softwood lumber industry, which had always been the mainstay of Maine's timber economy, continued shifting from the region to the South and Lake States.

As the national economy improved, lumber production and the number of sawmills operating in Maine increased. Stimulated by increased wartime demand for raw materials, the state's lumber production almost quadrupled from 1932 to 1942. It reached around 400 million board feet in 1942 and continued to rise throughout the balance of the 1940's. By the end of the decade, there were about 800 sawmills in Maine—nearly 8 times as many as in 1932 and 1933—producing nearly 500 million board feet of lumber.

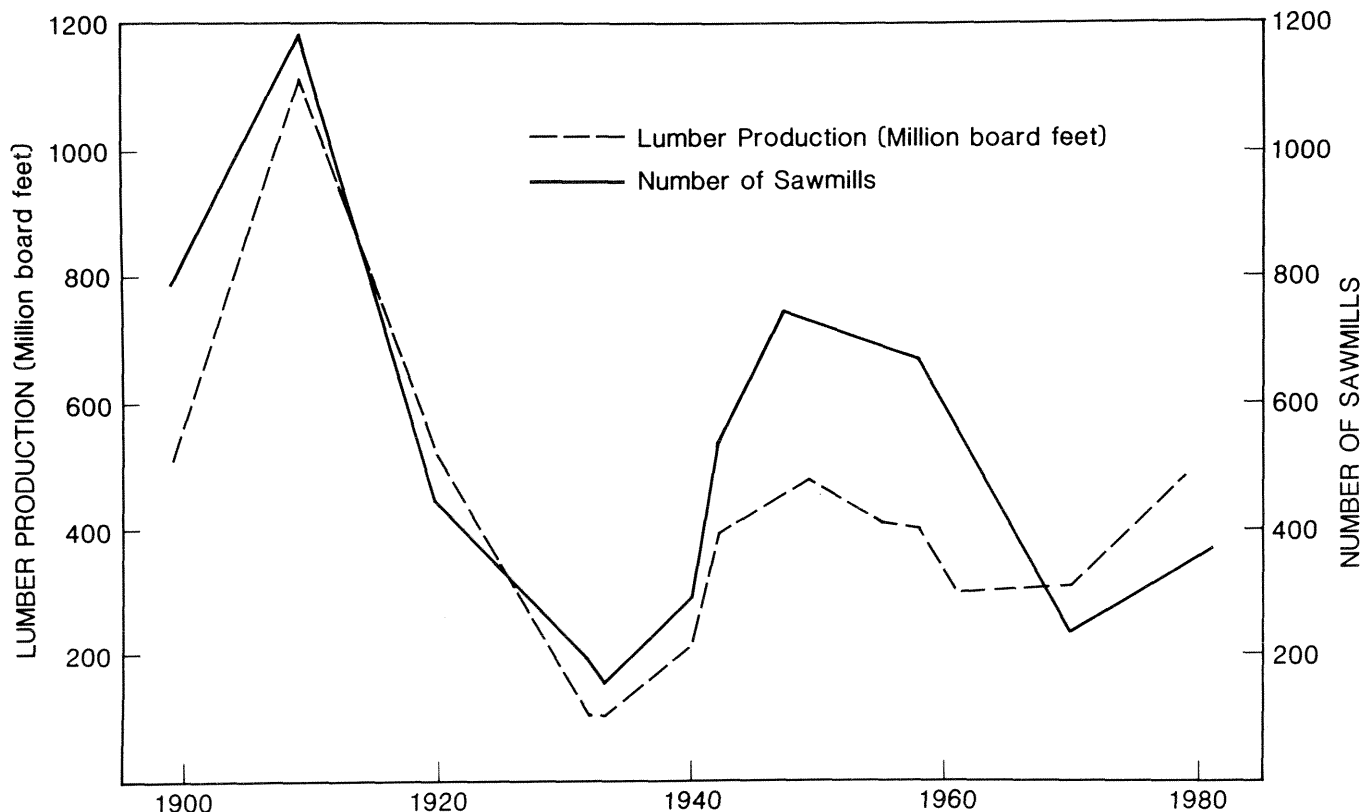


Figure 10.—Lumber production and number of sawmills in Maine for selected years between 1899 and 1981.

Housing demand had prompted increased lumber production and, by the 1950's, the circumstances that were responsible for the rapid changes of the previous three decades had disappeared. Annual production levels in Maine dropped slowly and remained around 400 million board feet throughout most of the 1950's; then stabilized around 300 million board feet during the 1960's representing the demand for lumber under relatively stable economic conditions. The levels of lumber production in Maine increased throughout the 1970's with the construction of more large-capacity mills and more efficient, specialized sawmills in the state manufacturing stud material from tree-length timber products. At the end of the 1970's, annual lumber production remained around 500 million board feet—about where it had been at the beginning of this century.

Annual lumber production in Maine has risen in recent years, and the number of sawmills operating in the state has increased also. There were 235 reported sawmills in 1970 and 368 in 1981, which included regular sawmills that cut logs 8 feet or more in length and bolter mills sawing logs less than 8 feet long. Some of the sawmills and bolter mills operated only intermittently; most were small and performed custom-sawing only. In 1981, there were 76 bolter mills as compared to 93 in 1970 and 131 in 1958. Many of the bolter mills saw logs into blanks for use by the turnery and furniture industries in addition to producing lumber for lobster-trap stock, pallet stock, box boards, and the like.

As in most other states in the Northeast and in most other regions of the country, most of Maine's lumber is produced by high-production mills making more than 1 million board feet annually. In 1981, there were 64 mills capable of producing more than 1 million board feet: 39 mills produced between 1 and 5 million board feet, 10 mills produced between 5 and 10 million board feet, and 15 mills made more than 10 million board feet of lumber (Table 5). Nearly

75 percent of the operating mills in Maine in 1981 sawed less than 1 million board feet. Nearly two-thirds of the high-production mills were located in three geographic units—Casco Bay, Penobscot County, and Western Maine. The Capitol Region and Casco Bay units had the largest number of custom and low-production mills and the most operating mills in the state. Most of the high-production mills sawed softwood logs almost exclusively for construction lumber products.

Maine's sawlog production in 1981 was 794 million board feet—a fourth more than in 1970 and nearly twice the 1958 sawlog harvest. In 1981, as in 1970, Aroostook County produced by far the most sawlogs and softwood sawlogs in the state (Table 7). Thirty-five percent of the state's sawlogs and its softwood sawlogs were harvested in the county. Nearly 257 million board feet of the 274 million board feet of the county's sawlogs were softwoods. The next largest sawlog-producing unit was Western Maine with under 15 percent of the softwood and total sawlogs. In 1981, as in 1970, Western Maine led the state in the output of hardwood sawlogs, followed closely by Aroostook County, at 30 and 28 percent, respectively. Since 1970, proportionately more of the state's sawlog cut and the production of both hardwood and softwood sawlogs has been in each of these two units.

Ninety-two percent of the total sawlog production in Maine in 1981 was from softwood trees (Fig. 11). As in 1970, three species groups—spruce, white pine, and balsam fir—accounted for most of the sawlog harvest. Both the volume of sawlogs cut from these three species and their combined share of the sawlog production has increased since 1970. Together these species accounted for 81 percent of Maine's 1981 sawlog output as compared to 64 percent in 1970. The percentage rise was due to a 12 percent increase in the spruce harvest and a 5 percent rise in balsam fir; the proportion of white pine to total harvest remained constant at

22 percent. In 1981, spruce made up 41 percent of all sawlogs and 45 percent of the softwood sawlogs cut in the state. Balsam fir accounted for 18 percent of all the sawlogs and one-fifth of the softwood sawlogs produced. The increased proportionate use of the spruces and balsam fir for sawlogs can be attributed most likely to the necessity of utilizing more of these two species groups as a result of spruce budworm damage, availability of these species, and the increased number of larger, more efficient sawmills in Maine.

In 1981, slightly more than one-fifth (160.5 million board feet) of Maine's sawlogs were shipped to manufacturers outside the state (Tables 7 and 18). Overall, the state was a net exporter of sawlogs—four times as many sawlogs were sent out of the state as were received from log processors outside Maine. Most of the interstate shipments went to and from Canada—nearly 119 million board feet of sawlogs went to Quebec and nearly 27 million board feet came from New Brunswick. Most of the sawlogs shipped to Canada and all of the sawlogs received from Canada were from softwoods. In 1981, Canadian mills received 151.2 million board feet of sawlogs from Maine, including 135.1 million board feet from softwoods. The volume of sawlogs sent to Canada has dropped considerably since the early 1970's when about 280 million board feet, which accounted for about half of Maine's softwood sawlog output and a fourth of its hardwood sawlogs, were shipped to Quebec. Since then, several Canadian mills near the border have closed, several others either moved to Maine or opened mills there, and milling capacity at Maine sawmills has increased by several hundred million board feet, contributing considerably to the decrease in Maine-to-Canada sawlog exports.⁴

⁴Readers interested in studying the effect of economic, political, and social pressure upon traditional patterns of wood flow between Maine and Canada are encouraged to read the literature by Aley, Coolidge, Everett, and Wallach listed in the references.

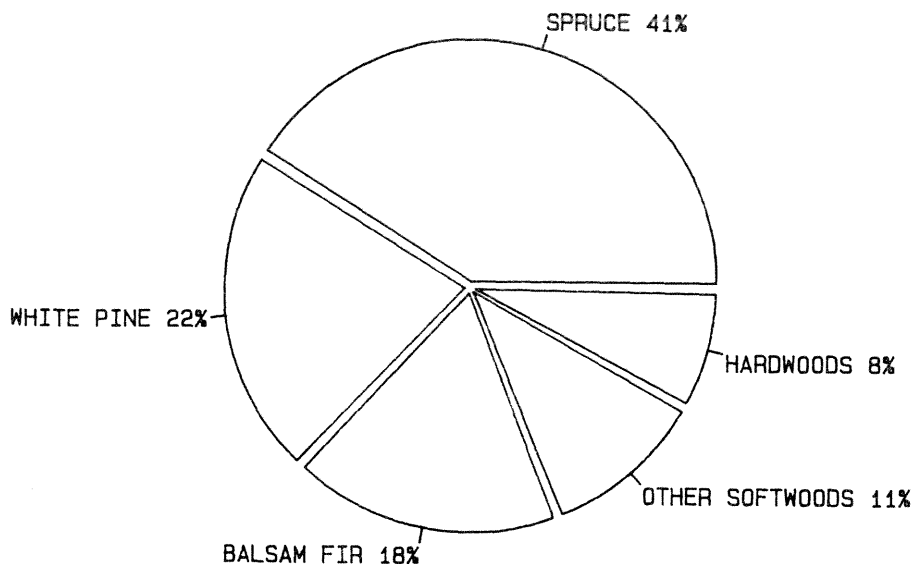


Figure 11.—Maine sawlog production in 1981, by species.

Within Maine, most of the regions' sawlog exports and imports were interregional transfers within the state rather than out-of-state shipments. Penobscot County was the only net importing unit and the largest importer of sawlogs—nearly three-fourths of the sawlogs it received in 1981 came from other units within Maine. Aroostook County was the largest exporting unit and the largest out-of-state exporter—nearly half of its sawlog production went out of Maine, mostly to Canada.

The Pulpwood Segment

Since 1868, when the first commercial woodpulp mill in Maine was started at Topsham, the state has always been an important pulpwood producer and user. The production of pulpwood soon became, and remains, the most important timber harvesting operation in Maine. By 1880, the pulp

and paper industry was well established in Maine, and by 1890, the state led the Nation in the production of wood pulp—producing nearly one-fourth of the national output. The production of pulpwood surpassed the sawlog harvest in the early part of this century, and for most of the time since, the state's pulpwood requirement has exceeded the timber products output for all the other wood-using industries combined. Although the pulp and paper industry was shifting in the early part of this century to the Lake States and beyond, Maine led the Nation in pulpwood consumption for most of the period.

Maine's pulpwood consumption was surpassed by New York in 1910, and once again, in 1933, by Washington. In 1933, Maine used about 931,000 cords as compared to 1.1 million cords for Washington and 479,000 for New York. Since then the state's woodpulp production has fallen and

risen over the years, and the number of pulpmills has declined. Fewer and fewer mills produced more and more woodpulp; and the woodpulp industry in Maine has continued to grow through increased use of hardwoods and wood-manufacturing residues, by increasing production capacity at existing mills, and through advances in pulping technology. Although Maine no longer leads the nation in pulpwood production, the annual production and consumption of pulpwood in Maine has increased generally over the years as the state has continued to lead the Northeast in pulpwood production and consumption. The state has maintained its status as one of the Nation's top producers and users of woodpulp. With established markets not subject to great fluctuations and large investments in facilities and timber lands, and as Maine's largest single industry, the pulp and paper industry has continued as a stable influence upon the state's timber products output and use.

Total pulpwood production, the roundwood harvest, and the use of chipped manufacturing residues in Maine have all grown in recent years (Fig. 12). This represents an incremental climb that began in 1976 following an economic slowdown in 1975. Since 1970, total pulpwood production in the state rose by 23 percent from about 3.5 million cords to nearly 4.3 million cords.

The production of pulpwood both from roundwood and from wood-manufacturing residues was an important part of Maine's woodpulp and other timber and timber-using industries in 1981. Although the volume of pulpwood cut in the state rose by only 6 percent from about 3.2 to nearly 3.4 million cords since 1970, it made up about four-fifths of the state's total pulpwood production and nearly two-thirds of its industrial timber harvest in 1981. Four-fifths of the increase of 786,000 cords since 1970 was from the production in 1981 of 3.5 times as much woodpulp from chipped residue.

Most of the state's roundwood pulpwood came from small diameter

trees and the upper bole sections of trees after higher valued logs and bolts had been removed. Because of the large volume of timber in dense, small-diameter stands of trees, the harvesting of sawlogs and veneer logs would be unprofitable in many cases without the harvesting of pulpwood along with them.

The availability of wood-manufacturing residues for conversion into pulp chips resulted from the volume of other forms of roundwood processed at other Maine mills. The rise in the volume of pulp chips from these residues was from the increase in roundwood receipts at Maine's sawmills, the construction of stud mills in the state, and increased utilization of the residues generated at these plants. The stud mills have integrated the production of lumber and chipped residues to alter manufacturing processes to favor the production of one product, depending on market conditions. In 1981, during a period of poor lumber demand, much of the material at the stud mills was chipped rather than processed into low-quality lumber; and the sale of residue chips and chippable material from slabs and

edgings was often critical to continued operations at many other sawmills. This and similar material, such as veneer cores and clippings, and trimmings from fence and piling manufacture, provided additional income to the state's processors of roundwood and more complete utilization of the resource.

In Maine, in 1981, fewer mills produced more woodpulp than in 1970. In 1970, the 17 woodpulp mills in the state consumed 3.7 million cords of pulpwood, both roundwood and chipped residue. In 1981, there were three fewer mills with receipts of 4.6 million cords—an increase of 24 percent resulting from increased capacities at the remaining mills.

During the last quarter century, technological advances in the pulping of wood have brought changes in the woodpulp industry and in the species composition of its raw material. Today, most woodpulp in Maine is still produced from softwoods, but the proportion of hardwoods, and the source of supply, have changed over the years. As recently as 1958, about 80 percent of the state's pulpwood came from softwood trees, and 2 percent came from chipped residue. By 1970, 72 percent was from softwoods and 8 percent was from chips (Fig. 12). In 1981, chipped residues accounted for a fifth of all the pulpwood produced in the state (Figs. 12 and 13). Softwood roundwood made up only 52 percent; and softwood from both roundwood and residue accounted for seven-tenths of the total pulpwood. Softwood material accounted for 90 percent of the chippable residue material produced in Maine for woodpulp in 1981.

Softwoods made up 64 percent of the roundwood pulpwood produced in Maine in 1981. Spruce and fir accounted for four-fifths of the softwoods and 52 percent of all species harvested. The remaining softwoods were about equally divided between two groups—pine, and hemlock and tamarack.

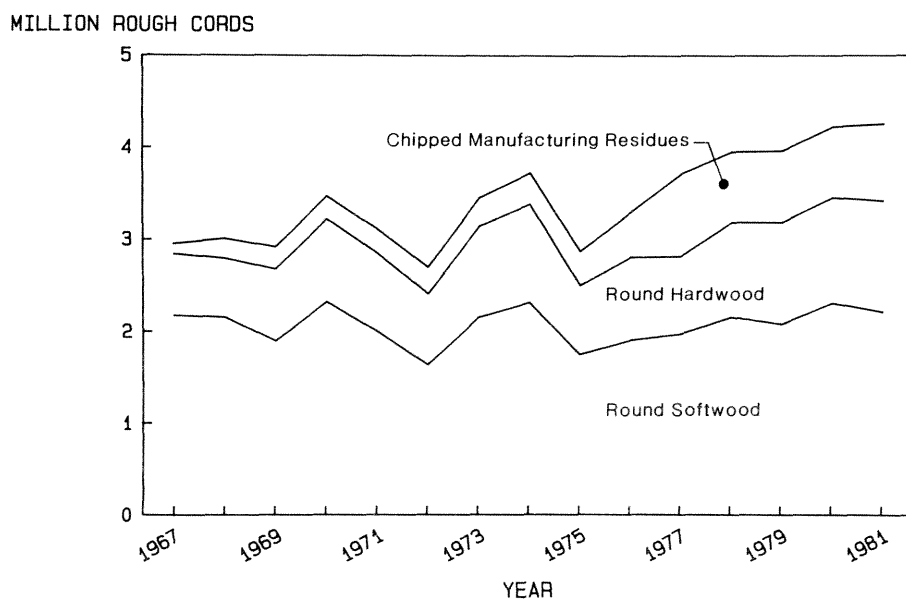


Figure 12.—Trends in pulpwood production in Maine for selected years, by source.

Since 1970, the pulpwood harvest has increased considerably in only three geographic units of the state, decreasing in all but one of the six other units:

Geographic unit	1970 (Thousand cords)	1981 (Thousand cords)	Change (Percent)
Aroostook County	706.2	600.8	- 15
Capital Region	216.2	217.8	1
Casco Bay	139.0	115.9	- 17
Hancock County	85.8	79.4	- 7
Penobscot County	475.7	400.7	- 16
Piscataquis County	448.2	588.0	31
Somerset County	370.7	581.0	57
Washington County	360.5	281.6	- 22
Western Maine	418.6	552.4	32
Total	3,220.9	3,417.6	6

Roundwood pulpwood production increased most in Somerset County—by 210,300 cords, followed by Western Maine with an increase of 133,800 cords. Aroostook County—still the state's largest producer of pulpwood—registered the largest decrease in volume (105,400 cords).

In 1981, four regions—Aroostook County, Piscataquis County, Somerset County, and Western Maine—each produced more than 550 thousand cords, or more than 16 percent, of the state's roundwood pulpwood—totalling 2.3 million cords for the four units for two-thirds of the pulpwood

harvest. In 1970, only Aroostook County produced more than 550 thousand cords. Most of the roundwood pulpwood in each of these four units was from softwoods; in Western Maine, the mix of hardwoods and softwoods was nearly equal.

Maine pulpmills consumed nearly all—97 percent—of the state's total pulpwood production from roundwood and chippable residues in 1981. Slightly more than half of the 144,200 cords of pulpwood shipped out-of-state went to mills in Canada (76,600 cords). The remainder was sent to other mills in New England.

Only 11 percent—512,000 cords—of the 4.6 million cords of pulpwood received at Maine mills came from outside the state—all from neighboring states and Canada. More than half of the shipments into the state were from Canada (264,000 cords). Most of the remaining receipts at Maine mills came from New Hampshire. Maine mill receipts of pulpwood in 1981 exceeded the volume produced in the state by 367,800 cords, making Maine a net importer of pulpwood.

Most of the pulpwood, both roundwood and chippable residues, sent out of the state was from softwoods. About half of the imported roundwood was softwood; most of the residues received from out-of-state were from hardwood material.

Nearly 45 million cords of pulpwood have been harvested from Maine timberlands during the last 15 years (Table 20). Total pulpwood production in Maine increased by 48 percent from 2.9 million cords in 1967 to 4.3 million cords in 1981, averaging 3 million cords per year for the period. During the period, the production of softwood roundwood showed some fluctuation, but remained fairly constant around an average of 2.1 million cords per year, as the softwood roundwood portion of total production dropped from 74 percent to 52 percent. The rise in total pulpwood production was

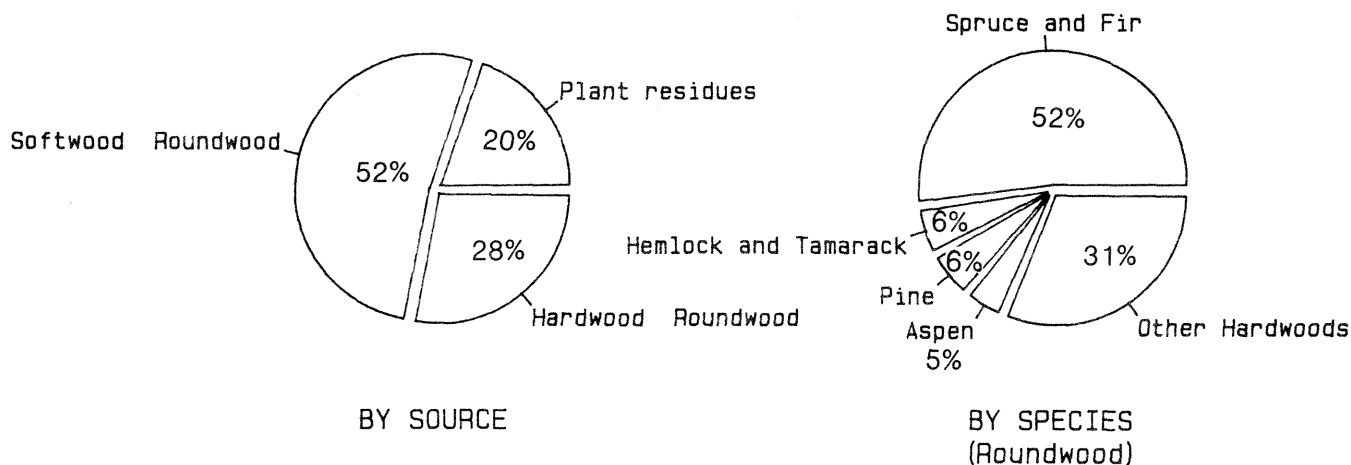


Figure 13.—Maine pulpwood production in 1981, in percent, by source and species.

mostly from increased hardwood roundwood harvest and increased use of manufacturing residues for pulp. During the last 15 years, Aroostook County has accounted for about one-fifth of the harvest for most of the period, dropping to 15 percent in 1975 and to 18 percent in 1981 during recessionary periods.

Averages for the three 5-year periods since 1967 clearly show the changes in Maine's pulpwood production in recent years:

	<i>Chippable residue</i>	<i>Softwood roundwood</i>	<i>Hardwood roundwood</i>	<i>Total pulpwood</i>
	<i>----- (Thousand cords) -----</i>			
1967-71	213	2,105	769	3,087
1972-76	360	1,943	902	3,205
1977-81	812	2,141	1,066	4,019

From the first 5-year period to the last, the volume of softwoods harvested remained constant while total pulpwood production rose by 30 percent, the hardwood roundwood portion rose by nearly 40 percent, and the production of residue for woodpulp nearly quadrupled. Compared to total pulpwood production, the portion represented by chipped residue rose from 7 to 20 percent, softwood roundwood dropped from 68 to 53 percent, and hardwood roundwood rose slightly from 25 to 27 percent.

Pulpwood production in Maine has risen over the years to meet increased pulping capacity at the state's mills to handle increased demand for woodpulp. Since 1967, the total daily pulping capacity of Maine's mills increased by 17 percent to 8,770 oven-dry tons as the number of mills dropped by 3 to 14. The existing mills, which have been operating for 50 years or more, have increased woodpulp production by expanding and improving their facilities and through more advanced, efficient technology to use the available resource.

In 1981, Maine's woodpulp mills used one mechanical and two chemical processes to make the pulp.

The groundwood process comprised 38 percent of the total daily capacity while the two chemical processes—sulfate and sulfite—made up 55 and 7 percent, respectively. Continued changes in demand for the paper products and in the pulping processes to produce the paper should continue to increase the utilization of hardwoods and chipped residue.

Other Segments of the Timber Industry

While the bulk of the timber harvest in Maine has been used to make lumber and woodpulp, many other smaller, stable wood-using industries in the state make a multitude of other products. For many years, these industries have been active and important, and have added stability to the state's timber economy. The veneer and wood-turning segments have been the most influential of the smaller industries, utilizing more hardwoods than the state's lumber segment to produce some very unique and useful products. Of the 21.6 million ft³, or remaining 5 percent, of the 1981 timber harvest not made into lumber or woodpulp, 12.8 million ft³ were used by the veneer and wood-turning industries. The balance of the

harvest, mostly softwoods, was used by other manufacturers to make cabin logs, fence stock, shingle stock, posts, poles, cooperage logs, miscellaneous dimension, and numerous other items. Most of these industries have exacting requirements and are willing to pay a premium for certain species, sizes, and other physical attributes.

The Veneer Log and Bolt Segment

Since 1958, Maine's annual veneer log harvest has fluctuated between 37 and 51 million board feet. Until recently, the number of veneer mills has remained around 12, while the volume of logs and bolts received at these mills has ranged between 39 and 45 million board feet per year, dropping below 30 million board feet in 1980 and 1981:

<i>Year</i>	<i>Harvest</i>	<i>Receipts</i>	<i>Number of mills</i>
	<i>---(Million board feet)^a---</i>		
1958	43.0	^b	11
1963	51.3	42.9	^b
1968	49.7	44.7	13
1969	48.5	^b	^b
1970	37.0	^b	12
1972	38.0	41.0	11
1976	40.3	39.0	10
1980	39.9	27.0	8
1981	38.4	29.9	8

^aInternational 1/4-inch rule.

^bData unavailable.

For most of the period, 1963-80, more veneer logs have been produced and utilized in Maine than in any other of the 14 northeastern states. It was not until 1980 that mills in any other northeastern state received more veneer logs than Maine mills—when the receipts for Maryland exceeded Maine's receipts by 1.6 million board feet.

All of the veneer logs and bolts from Maine are used to make commercial and face veneer for plywood and furniture and to make material for specialty products. The majority of the logs harvested in Maine for

commercial and face veneer are shipped to manufacturers outside the state, mostly to Canadian plywood mills. Nearly all of the veneer logs retained within the state and received from log processors outside the state are used by veneer mills within Maine to make specialty products.

Nearly half of the veneer logs and bolts produced in Maine in 1981 came from Washington County and Western Maine. Washington County produced over 10 million board feet, and nearly 9 million board feet came from Western Maine. Somerset County accounted for 14 percent of the production, and less than 10 percent came from each of the remaining six regions.

Maine's veneer industry and the production and receipts of veneer logs have declined since the mid-1960's. In recent years, declines in the economy, lessened product demand, competition from substitute products, the shift of the furniture and plywood industries to southern states, and the importation of Canadian plywood—much of which has been made from Maine logs—have been the major contributing factors. Since 1968, all three of Maine's hardwood plywood manufacturers and two specialty-veneer mills have closed; the production of veneer logs within the state has dropped by 23 percent and its veneer log receipts fell by about one-third.

Generally, over the years, more veneer logs and bolts have been produced annually in Maine than were used there. In 1981, the state was a net exporter of veneer logs and bolts, with nearly 8.6 million board feet more shipped out of state than received by the Maine mills.

In 1981, nearly 26 million board feet, or two-thirds, of Maine's veneer log production was retained in the state; only 3.9 million board feet of veneer logs were imported from outside the state. New Brunswick received nearly two-thirds of the 12.5 million board feet of the exported logs, and contributed nearly four-tenths of the imported logs. Quebec

received one-third of the interstate shipments from Maine and shipped one-fifth of those received in Maine. New Hampshire supplied more than three-tenths of the veneer logs shipped into Maine from out-of-state log processors. Vermont accounted for less than 2 percent of the interstate shipments from Maine and for less than 10 percent of those veneer logs received by Maine.

Most of the veneer logs exported from Maine to New Brunswick in 1981 were from softwoods—mostly spruce. All of the logs sent from Maine to Vermont and Quebec were from hardwoods. All of the logs retained in or imported into Maine in 1981 were hardwoods—mostly white birch.

Most of the hardwood logs received by Maine's veneer industry in 1981 were used to make a vast array of specialty veneer products, such as beverage stirrers, toothpicks, frozen dessert sticks, forks, spoons, and the like. These products are stamped by cutting dyes at the specialty veneer plants from hardwood veneers that are neither container nor plywood veneers.

Maine has seven manufacturers of specialty veneers—more than any other state—located in central and southern Maine. The only other veneer mill is in Aroostook County and makes hardwood face veneer for paneling.

The specialty veneer mills add stability to Maine's wood-using industry—the number of mills, the species they use, and the products they make seldom change. Veneer-log receipts for these mills have changed slightly from year to year fluctuating with the economy and finished product demand. In 1968, about 25 million board feet were received by Maine's specialty mills. Receipts for specialty veneer-logs peaked in 1976 at 31.2 million board feet. Then, in 1980 and 1981, log receipts at Maine's specialty-veneer mills dropped to a low near 24 million board feet in the midst of poor economic conditions and decreased product demand.

The Turnery Bolt and Log Segment

Although the wood-turning industry in Maine has considerably more mills of much smaller size than the veneer industry, the wood-turning industry is nearly as active, as stable, and as important with respect to the state's timber-using industry. For many years, the wood-turning industry has used a variety of hardwood logs and bolts to make a variety of products, such as dowels, thread spools, textile bobbins, brush handles, billiard cues, furniture parts, ladies' shoe heels, and many other specialized and unique products. Logs and bolts of suitable quality and species for the wood-turning industry are often cut with sawlogs and pulpwood, then resold to the turneries at higher prices. Because of the importance and uniqueness of the industry, its products, and its raw material requirements, special care was taken in the 1981 Maine timber industry survey to segregate the production and receipts of logs and bolts used by the turnery mills.

The number and location of the mills, the species and volumes of material used, and the products produced have changed little since 1970. In 1981, there were about 40 turnery mills throughout the state consuming about 94,000 cords, or 8 million ft³, of mostly hardwood bolts and logs.

The principal species used by the wood-turning industry in 1981 was white birch, followed in order by yellow birch, hard maple, aspen, beech, white ash, and soft maple. Only minimal volumes of softwoods and other hardwoods were used.

White birch comprised nearly half of the turnery bolts and logs produced in the state in 1981; and 40 percent of the bolts and logs received by Maine's turnery mills from all log processors in and out of the state. All of the 81,000 cords of turnery logs and bolts cut in Maine went to in-state mills.

Miscellaneous Segments

Maine has several smaller wood-using industries numbering about 170 mills which manufacture many other wood products, such as cabin logs, clothespins, cooperage, fencing, tool handles, piling, poles, shingles, and landscape and railroad ties (Figs. 14, 15, and 16). The combined 1981 timber products requirements from the state forest lands for these industries were only 8.8 million ft³ (less than 50 million board feet)—2 percent of the state's total timber products output.

Maine is well known for its production of fencing products, particularly rustic fences. About 16.4 million board feet, or 3 million ft³, of the state's 1981 timber products output was used by the fence industry. Nearly all of this material was white cedar used by the rustic fence industry to make posts, rails, and pickets for stockade-type fences. All of the timber harvested in Maine in 1981 for the fence industry, including very small volumes of hardwoods and other softwoods, was retained in the state. An additional 1.8 million board feet of white cedar was imported by the industry from Quebec. Following a period of growth from 1958 to 1970, the rustic-fence industry has shown decline over the last 11 years as a result of Canadian competition. In 1958 and in 1970, 7.9 and 24.4 million board feet, respectively, of Maine's timber was used by the industry. Fence-post production ranged from 123,000 posts in 1958 to 648,000 in 1970 to 480,000 in 1981.

One of the more important and more unique of the smaller wood-using industries in Maine is the manufacture of clothespins. Of the Nation's four manufacturers of wooden clothespins, the three largest, located in Maine, produce about 690 million clothespins annually—over half of the Nation's annual demand of 1.3 billion clothespins and nearly all of the nation's total production. Most of the remaining national clothespin requirement is imported from other



Figure 14.—Maine timber products are still used to build ships. In Thomaston, Maine, red oak is made into ship timber. (Maine Forest Service).

countries. To meet this type of demand, Maine's clothespin manufacturers consumed 5.7 million board feet of hardwoods, mostly beech, in 1981. All of the 4.4 million board feet of the roundwood cut in Maine in 1981 to make clothespins went to manufacturers within the state. Most of the remaining one-fourth of the states' raw material requirements for the clothespin manufacturers came from New Hampshire.

Most of the remainder of Maine's 1981 timber harvest went to manufacturers of shingles and landscape and railroad ties. More than 7.8 million board feet were used to make shingles and about 7.4 million board feet were used for ties. About another 2 million board feet each were used to make cabin logs and miscellaneous types of wood-tool products, such as tool handles, small poles, and rods for prying. Less than 300,000 board feet of timber products went to make

cooperage, piling, and large poles. The cooperage industry in Maine, which makes slack cooperage products, such as barrels and tubs for seafood, poultry, and vegetables, has declined over the years almost to the point of nonexistence as a result of competition from substitute products. Most of the cooperage made in Maine in 1981 consisted of novelty items, such as buckets and pails, and furniture. In 1981, the cooperage industry used only 200,000 board feet of softwoods as compared to 545,000 board feet in 1970 and 1,633,000 board feet in 1958. Some of Maine's 1981 timber harvest was used by one company to make waferboard—a relatively new composite product for the construction industry. Since 1981, the recent construction of two additional waferboard plants in Maine has added stimulus to the state's timber industry and its utilization of both the hardwood and softwood timber resource.



Figure 15.—Miscellaneous, custom dimension stock being made from white birch bolts at Sangerville, Maine. (Maine Forest Service).



Figure 16.—Sawmill and bolter mill facilities at a handle and dowel factory in Eddington, Maine. (Maine Forest Service).

The Use of Manufacturing Residues

Primary wood manufacturing residues, such as bark, chips, slabs, sawdust, and the like, have increased in utility and value over the years. Maine's pulpmills, especially, its veneer mills and sawmills, and many other industrial facilities have been using residues as readily available, dependable, and alternative raw material sources for woodpulp and energy. Economic and environmental considerations have discouraged Maine's wood-product manufacturers from disposing of their residues through dumping and open burning, and have encouraged them to either use or market this material.

Not only have Maine's primary wood manufacturers become more efficient in converting logs and bolt-wood into other products, but they and other wood residue users have made considerable use of the residues generated in the conversion (Table 24 and Fig. 17). In 1981, nearly 62 million ft³ of residues were generated by Maine's primary wood manufacturers, excluding the woodpulp industry. Over 60 million ft³, or about 98 percent, of the residues were recovered and used. Woody material accounted for 48.1 million ft³, or

78 percent, of the residues; bark amounted to 13.7 million ft³.

There was a very heavy demand for all types of residues, both bark and the woody material, in Maine in 1981. Ninety-six percent of the available bark was recovered and used, mostly as fuel, and 98 percent of the wood residues were recovered and used, mostly as raw material for the woodpulp industry. More than half of the woody material was coarse residue, such as sawmill slabs and edgings, suitable for conversion into wood chips for fiber products. Nearly four-fifths of the coarse residue was eventually made into fiber; most of the rest was used as fuelwood. Thirty-six percent of the fine residue, such as sawdust and shavings, also went for fiber. An equal amount of the fine residue was used for fuel, and nearly one-fourth was used for livestock bedding and farm and horticultural mulch. In 1981, only 4 percent or less of the total residues and each type of residue went unused or for other purposes (Fig. 18). This percentage is similar to that noted in timber industry surveys for other northeastern states (Wharton 1984).

As a result of increased use, the volume of unused wood residues at primary manufacturing plants has dropped substantially in recent years. In 1970, 10.4 million ft³ of coarse and fine wood residues went unused. In 1981, less than one-tenth as much—885 thousand ft³—went unused (Table 24).

The amount of residues used for fuel has increased substantially over the years. In 1970, only 8.4 million ft³ of wood-industry residues were used for fuel. By 1981, the volume of bark and wood residues used for this purpose had nearly tripled to 24.7 million ft³ (Fig. 19).

In 1981, the pulpmills in Maine used most of the 34 million ft³ of the bark residue they generated for fuel. Eleven of the fourteen mills have boilers to burn the bark, and an additional mill has planned to build a boiler. Ninety-five percent of the bark was used mainly for fuel, with a small portion used for mulch and other uses. The unused 5 percent was either disposed of or stockpiled for future use.

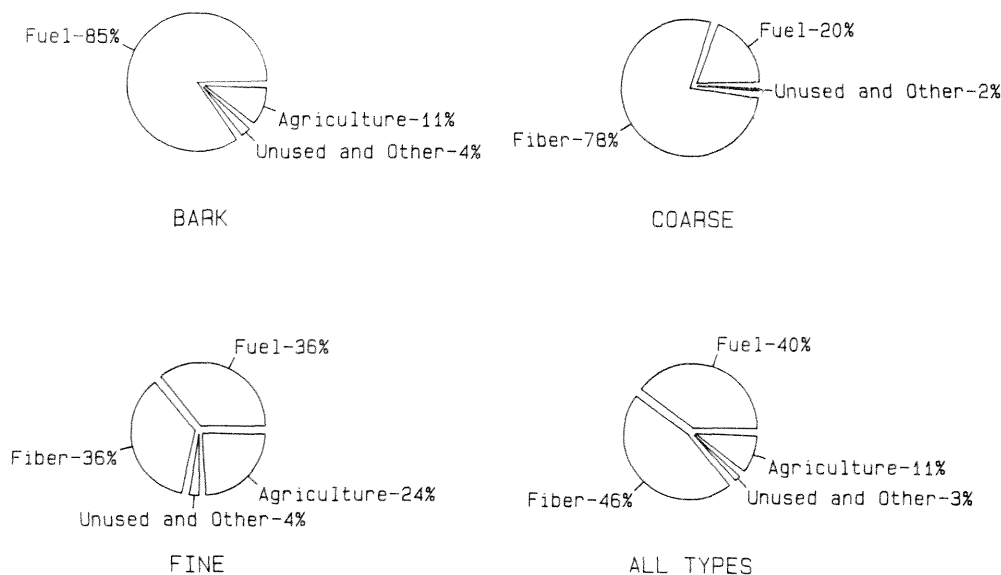


Figure 17.—Wood-manufacturing plant residue use in Maine in 1981, in percent, by residue type.

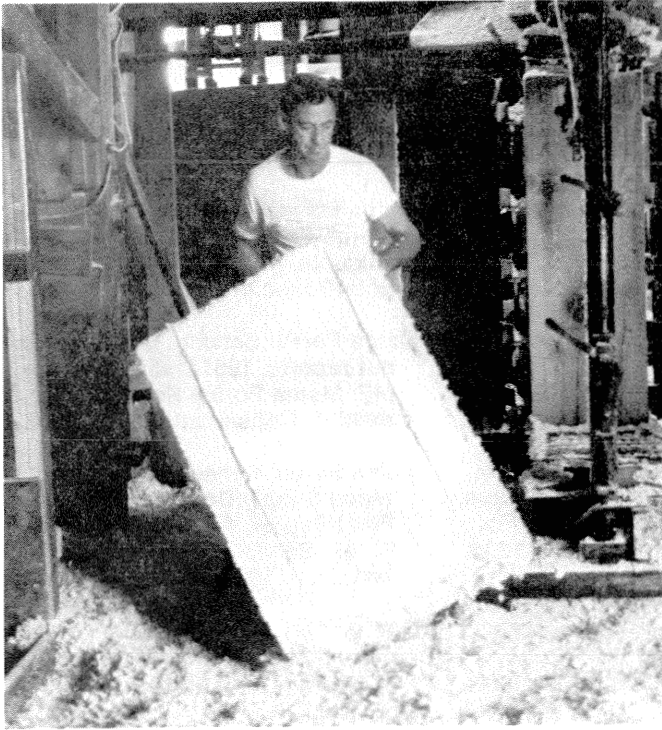


Figure 18.—Manufacturing plant residues are used extensively in Maine. At Clifton, wood shavings are baled to form backstops for targets. (**Maine Forest Service**).



Figure 19.—Forty percent of Maine's primary manufacturing plant residues are used for fuel, mostly as industrial fuel. At this sawmill in Sanford, Maine, plant residues and roundwood chips are mixed to fuel boilers for steam and heat for kilns, and to provide heat and co-generated electricity to the mill. Excess electricity is supplied to the local electric company during non-peak hours (**Maine Forest Service**).

Literature References

- Aley, Jack. **The export of Maine sawlogs to Quebec.** Augusta, ME: Maine Department of Conservation, Forest Service, Division of Planning and Development; 1981. 53 p.
- Barrett, John W. **Regional silviculture of the United States.** New York: Ronald Press; 1962. 610 p.
- Bones, James T.; Dickson, David R. **Pulpwood production in the Northeast 1970.** Resour. Bull. NE-24. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station; 1971. 34 p.
- Bones, James T.; Dickson, David R. **The veneer industry in the Northeast.** A 5-year updating of data on veneer log production and receipts. Resour. Bull. NE-21. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station; 1970. 15 p.
- Carroll, Charles F. **Wooden ships and American forests.** Journal of Forest History. 25(4):213-215; 1981.
- The Commercial Bulletin. **Chips and shavings.** Commercial Bulletin. 6619:7, 6631:6; 6632:6; 6635:6; 1982.
- Coolidge, Philip T. **History of the Maine woods.** Bangor, ME: Furbish-Roberts Printing Co., Inc.; 1963. 805 p.
- Crane, J. R. **Maine looks to the future.** American Forests. 66(6):20-23, 51; 1960.
- Everett, Jon. **Logging in the Maritime triangle.** Canadian Forest Industries. 102(3):26-30; 1982.
- Ferguson, Roland H.; Kingsley, Neal P. **The timber resources of Maine.** Resour. Bull. NE-26. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station; 1972. 129 p.
- Ferguson, Roland H.; Longwood, Franklin R. **The timber resources of Maine.** Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station; 1960. 75 p.
- Irland, Lloyd C. **Reconstituted wood panel products outlook for New England and Maine.** Augusta, ME: Maine State Planning Office, Executive Department; 1981. 31 p.
- Johnson, Eric A. **A family tradition.** Northern Logger. 31(11):11, 42; 1983.
- Larson, Edwin H. **The forest wealth of Maine.** Portland, ME: Maine Forest Service and Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station; 1961. 29 p.
- Maine Forest Products Council. **Maine Forest Facts.** 3rd ed. Augusta, ME: Maine Forest Products Council; 1979. 14 p.
- Maine Forest Service. **Maine timber cut reports.** 1951-1981. Augusta, ME: Maine Forest Service, Department of Conservation; 1952-1982.
- Maine Forest Service. **Spruce-Fir Wood Supply/Demand Analysis, Final Report.** Augusta, ME: Maine Forest Service, Department of Conservation; 1983. 94 p.
- Montgomery, M. R. **The thing about clothespins.** The Boston Globe Magazine. 1982 May 23:13, 40-45.
- Nevel, Robert L., Jr. **Veneer, 1980—A periodic assessment of regional timber output.** Resour. Bull. NE-77. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station; 1983. 17 p.
- Nevel, Robert L., Jr.; Blyth, James E. **Veneer log production in the north-eastern and north central states in 1980.** Northern Logger. 31(11): 40-41; 1983.
- The Northern Logger and Timber Processor. **Maine contractor makes good by adapting to a changing industry.** Northern Logger. 31(11): 10, 24, 28; 1983.

- The Northern Logger and Timber Processor. **Nothing is wasted at Diamond stud mill.** Northern Logger. 31(11):8-9, 28; 1983.
- The Northern Logger and Timber Processor. **Maine fence company toughs it out.** Northern Logger. 32(1):14-15; 1983.
- Pinkett, Harold T. **Sources of American forest and conservation history.** Journal of Forest History. 25(4):210-212; 1981.
- Rammrath, Rita M.; Gooley, Walter R., Jr. **So distinguished a forest: only in Maine.** . . . Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Experiment Station; 1970. 28 p.
- Smith, David C. **A history of lumbering in Maine: 1861-1960.** Orono, ME: University of Maine Press; 1972. 468 p.
- Steer, Henry B. **Lumber production in the United States, 1779-1946.** Misc. Publ. 669. Washington, DC: U.S. Department of Agriculture, Forest Service, Div. of Forest Economics; 1948. 233 p.
- U.S. Bureau of the Census. **Current industrial reports.** Lumber production and mill stocks 1959-1981. MA-24T(60)-1 through MA-24T(81)-1. Washington, DC: U.S. Department of Commerce, Bureau of the Census; 1962-1983.
- U.S. Bureau of the Census. **Facts for industry reports.** Forest products: 1945-1947. Lumber, lath, and shingle production. M13G-05 through M13G-07. Washington, DC: U.S. Department of Commerce, Bureau of the Census; 1947-1950.
- U.S. Bureau of the Census. **Facts for industry reports.** Lumber production and mill stocks 1950-1954. M13G-01 through M13G-04. Washington, DC: U.S. Department of Commerce, Bureau of the Census; 1952-1957.
- U.S. Bureau of the Census. **Facts for industry reports.** Lumber production and mill stocks 1956. M24T-06. Washington, DC: U.S. Department of Commerce, Bureau of the Census; 1958.
- Vermont Department of Forests and Parks. **New England's newest wood industry—reconstituted panels.** Vermont Forest Exchange and Information Bull. Montpelier, VT: Vermont Agency of Environmental Conservation, Department of Forests and Parks; 1982 January: 11-13.
- Wallach, Bret. **Logging in Maine's empty quarter.** Annals of the Association of American Geographers. 70(4):542-551; 1980.
- Wharton, Eric H. **Changing attitudes about tree merchantability in the Northeast.** Northern Logger. 32(7): 16-17; 1984.
- Widmann, Richard H. **Pulpwood production in the Northeast—1981.** Resour. Bull. NE-76. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station; 1983. 23 p.

Appendix

Definition of Terms

Harvest

Harvest. The aggregate volume of timber produced for industrial or consumer uses.

Timber products output. Includes roundwood (round timber) products harvested from growing stock on commercial forest land; from other sources, such as cull trees, salvable dead trees, limbs and tops, and saplings; from trees on noncommercial and nonforest lands; and from manufacturing plant byproducts.

Industrial timber harvest. Total production of round timber for conversion into wood products, except fuelwood.

Manufacture

Primary wood-manufacturing plant. A plant that converts roundwood (round timber) to wood products such as woodpulp, lumber, veneer, cooperage, and dimension.

Roundwood products. Logs, bolts, and other round timber generated from harvesting trees for industrial or consumer use.

Sawlog. A roundwood product, from which products such as lumber are sawn, and which meets certain minimum standards of diameter, length, and defect, including a minimum 8-foot length and combination of size and defect specified in regional standards.

Pulpwood. Roundwood mostly converted into 4- or 5-foot lengths or chips and chipped plant residues that are used to make woodpulp.

Boltwood. Roundwood mostly converted into 4- to 6-foot lengths to be sawn into lumber at bolter-type

sawmills, prepared for the manufacture of woodpulp, or used to make other products, such as cooperage, turned products, and veneer, from short, round timber.

Turnery log or bolt. A roundwood product from which blanks are sawn and turned that usually meet certain minimum standards of diameter, length, and defect.

Veneer log or bolt. A roundwood product from which veneer is sliced or sawn that usually meets certain minimum standards of diameter, length, and defect.

Cabin logs. Relatively slender round timber products cut to standard sizes and meeting specifications of strength, straightness, and soundness, finished for use in constructing cabins, barns, and other buildings.

Piles (piling). Relatively slender structural round timber products cut to the maximum length possible within top-circumference and other specifications of strength, straightness, and soundness, to be driven or otherwise introduced into the soil, usually to provide vertical or lateral support in buildings, foundations, and other structures.

Poles. Round timber products cut to standard sizes and meeting specifications of strength, straightness, and soundness to be driven into the soil, usually to provide vertical or lateral support for electric power and telephone transmission lines.

Posts. Short, round timber products to be used in the upright position to support fence structures.

Roundwood production. The manufacture of roundwood (round timber) products, such as logs and bolts, generated from harvesting trees for conversion into wood products.

Roundwood receipts. The roundwood (round timber) products, such as logs and bolts, received by primary wood-manufacturing plants for conversion into wood products.

Residues

Manufacturing plant residues. Bark and woody materials that are generated when round timber (roundwood) is converted into wood products; includes slabs, edgings, trimmings, miscuts, sawdust, shavings, veneer cores and clippings, and pulp screenings.

Plant byproducts. Wood products such as pulp chips, recycled from manufacturing plant residues.

Unused manufacturing residues. Plant residues that are dumped or destroyed and not recovered from plant byproducts.

Coarse residues. Manufacturing residues suitable for chipping, such as slabs, edgings, and veneer cores.

Fine residues. Manufacturing residues not suitable for chipping, such as sawdust and shavings.

Species

Softwoods. Coniferous trees, usually evergreen, with needles or scale-like leaves.

Hardwoods. Dicotyledonous trees, usually broad-leaved and deciduous.

Index to Tables

Industrial Timber Products

1. Volume of industrial roundwood, by product harvested, Maine, 1981.
2. Change in timber products output, Maine, 1970 and 1981.
3. Industrial timber harvest, by major species group, Maine, for selected years.
4. Industrial timber harvest, by geographic unit, softwoods and hardwoods, and products, Maine, 1981.

Sawlog Industry Statistics

5. Number of operating sawmills, by geographic unit and annual production class, Maine, 1981.
6. Sawlog production and receipts relationships, by geographic unit, Maine, 1981.
7. Sawlog production, by softwoods and hardwoods, geographic unit, and destination of shipment, Maine, 1981.
8. Sawlog receipts, by softwoods and hardwoods, geographic unit, and origin of shipment, Maine, 1981.
9. Sawlog production and receipts in the Aroostook County Unit, by species, and destination and origin of shipment, Maine, 1981.

10. Sawlog production and receipts in the Capital Region Unit, by species, and destination and origin of shipment, Maine, 1981.

11. Sawlog production and receipts in the Casco Bay Unit, by species, and destination of and origin shipment, Maine, 1981.

12. Sawlog production and receipts in the Hancock County Unit, by species, and destination and origin of shipment, Maine, 1981.

13. Sawlog production and receipts in the Penobscot County Unit, by species, and destination and origin of shipment, Maine, 1981.

14. Sawlog production and receipts in the Piscataquis County Unit, by species, and destination and origin of shipment, Maine, 1981.

15. Sawlog production and receipts in the Somerset County Unit, by species, and destination and origin of shipment, Maine, 1981.

16. Sawlog production and receipts in the Washington County Unit, by species, and destination and origin of shipment, Maine, 1981.

17. Sawlog production and receipts in the Western Maine Unit, by species, and destination and origin of shipment, Maine, 1981.

18. Sawlog production and receipts, by species, and destination and origin of shipment, Maine, 1981.

Other Timber Industry Statistics

19. Pulpwood production, by softwoods and hardwoods, Maine, 1967-81.

20. Pulpwood harvest, by softwoods and hardwoods, and geographic unit, Maine, 1967-81.

21. Veneer log production in Maine, by species and consuming state, 1981.

22. Veneer log receipts in Maine, by species and producing state, 1981.

23. Veneer log production and receipts in Maine, for selected years, 1963-81.

24. Production and disposition of manufacturing residues, by type of use and type of residue, Maine, 1981.

25. Volume of unused sawmill residues, by geographic unit, softwoods and hardwoods, and type of residue, Maine, 1981.

Round Timber Conversions for Major Products

Softwood sawlogs: M bf(International ¼-inch rule) = 160.1 ft³ = 4.54 m³

Hardwood sawlogs: M bf(International ¼-inch rule) = 152.4 ft³ = 4.32 m³

Pulpwood and turnery bolts: 1 standard cord = 85 ft³ = 2.41 m³ = about 2.3 green tons, depending on species.

Veneer and cooperage logs and bolts: M bf(International ¼-inch rule) = 152.9 ft³ = 4.33 m³

Table 1.—Volume of industrial roundwood, by product harvested, Maine, 1981

Product	Standard unit	Volume in standard units		
		Softwoods	Hardwoods	All species
Sawlogs ^a	M board feet ^b	730,896	62,881	793,777
Pulpwood	Standard cords ^c	2,198,571	1,219,015	3,417,586
Turnery bolts ^d	Standard cords ^c	212	80,960	81,172
Veneer logs and bolts	M board feet ^b	8,116	30,327	38,443
Cabin logs	M linear feet	719	—	719
Fence stock ^e	M board feet	16,255	106	16,361
Misc. products ^f	M ft ³	1,960	3,538	5,498

Product	Roundwood volume			Roundwood volume		
	Softwoods	Hardwoods	All species	Softwoods	Hardwoods	All species
	----- Thousand ft ³ -----			----- Thousand m ³ -----		
Sawlogs ^a	117,007	9,581	126,588	3,313.8	271.4	3,585.2
Pulpwood	186,879	103,616	290,495	5,292.7	2,934.6	8,227.3
Turnery bolts ^d	18	6,882	6,900	.5	194.9	195.4
Veneer logs and bolts	1,241	4,636	5,877	35.1	131.3	166.4
Cabin logs	316	—	316	8.9	—	8.9
Fence stock ^e	2,985	23	3,008	84.5	.7	85.2
Misc. products ^f	1,960	3,538	5,498	55.5	100.2	155.7
Total	310,406	128,276	438,682	8,791.0	3,663.1	12,424.1

^aIncludes boltwood sawn into lumber and lobster-trap stock.

^bInternational 1/4-inch rule.

^cRough wood basis, equivalent to 85 ft³ of solid wood.

^dIncludes boltwood used to make products such as dowels, furniture parts, thread spools, and other turned products.

^eIncludes stock for posts, rails, and pickets.

^fIncludes landscape and railroad ties, cooperage logs and bolts, poles, piling, and stock for clothespins, miscellaneous dimension, shingles, tool handles and small poles, and numerous other items.

Table 2.—Change in timber products output, Maine, 1970 and 1981

Product	All species			Softwoods			Hardwoods		
	1970	1981	Change	1970	1981	Change	1970	1981	Change
	<i>Million ft³</i>		<i>Percent</i>	<i>Million ft³</i>		<i>Percent</i>	<i>Million ft³</i>		<i>Percent</i>
Sawlogs ^a	98.2	126.6	+29	82.8	117.0	+41	15.4	9.6	-38
Pulpwood	273.8	290.5	+6	197.2	186.9	-5	76.6	103.6	+35
Turnery bolts ^b	7.6	6.9	-9	*	*	—	7.6	6.9	-9
Veneer logs and bolts	6.6	5.9	-11	*	1.2	^d	6.6	4.7	-29
Misc. products ^c	3.9	8.8	^d	3.9	5.3	+36	*	3.5	^d
Total	390.1	438.7	+12	283.9	310.4	+9	106.2	128.3	+21
	<i>Million m³</i>			<i>Million m³</i>			<i>Million m³</i>		
Sawlogs ^a	2.8	3.6		2.3	3.3		0.4	0.3	
Pulpwood	7.7	8.2		5.6	5.3		2.2	2.9	
Turnery bolts ^b	.2	.2		*	*		.2	.2	
Veneer logs and bolts	.2	.2		*	*		.2	.1	
Misc. products ^c	.1	.2		.1	.2		*	.1	
Total	11.0	12.4		8.0	8.8		3.0	3.6	

^aIncludes boltwood sawn into lumber and lobster trap stock.

^bIncludes boltwood used to make products, such as dowels, furniture posts, thread spools, and other turned products.

^cIncludes cabin logs, fence stock, landscape and railroad ties, cooperage logs and bolts, poles, piling, and stock for clothespins, miscellaneous dimension, shingles, tool handles and small poles, and numerous other items.

^dGreater than 100 percent.

*Less than 50,000 ft³ or 50,000 m³.

**Table 3.—Industrial timber harvest, by major species groups, Maine, for selected years
(In millions of ft³)^a**

Year	All products			Pulpwood			Excluding pulpwood		
	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods
1951 ^b	266.4	211.3	55.1	166.9	126.9	40.0	99.5	84.4	15.1
1956 ^b	319.5	250.2	69.3	225.9	177.8	48.1	93.6	72.4	21.2
1958 ^c	228.9	164.8	64.1	140.5	111.2	29.3	88.4	53.6	34.8
1966 ^b	341.6	249.6	92.0	235.2	178.6	56.6	106.4	71.0	35.4
1970 ^d	390.1	284.0	106.1	273.8	197.2	76.6	116.3	86.8	29.5
1971 ^b	368.3	266.5	101.8	241.2	169.6	71.6	127.1	96.9	30.2
1975 ^b	342.0	252.3	89.7	211.8	147.8	64.0	130.2	104.5	25.7
1981 ^e	438.7	310.4	128.3	290.5	186.9	103.6	148.2	123.5	24.7

^aSource data prior to 1981 converted to cubic feet using 500 board feet or 1 cord equals 85 ft³ of solid wood, rough wood basis, when cubic footage was unknown or for purposes of comparison.

^bSource: Maine Forest Service, 1952-82, except as noted.

^cSource: Ferguson and Longwood.

^dSource: Ferguson and Kingsley.

^e1981 data based on conversion factors developed for this survey following table index.

**Table 4.—Industrial timber harvest,^a by geographic unit,
softwoods and hardwoods, and products,
Maine, 1981**

Geographic unit and species group	Sawlogs	Pulpwood	Other products ^b	All products
<i>Thousand ft³</i>				
Aroostook County				
Softwoods	41,073	42,313	3,085	86,471
Hardwoods	2,674	8,775	1,335	12,764
Total	43,747	51,068	4,420	99,235
Capital Region				
Softwoods	5,605	13,030	141	18,776
Hardwoods	1,250	5,482	977	7,709
Total	6,855	18,512	1,118	26,485
Casco Bay				
Softwoods	10,904	6,927	65	17,896
Hardwoods	850	2,924	1,077	4,851
Total	11,754	9,851	1,142	22,747
Hancock County				
Softwoods	5,740	3,485	92	9,317
Hardwoods	64	3,264	308	3,636
Total	5,804	6,749	400	12,953
Penobscot County				
Softwoods	9,336	19,406	1,016	29,788
Hardwoods	312	14,654	1,887	16,853
Total	9,678	34,060	2,903	46,641
Piscataquis County				
Softwoods	11,064	34,866	171	46,101
Hardwoods	1,178	15,114	1,284	17,576
Total	12,242	49,980	1,455	63,677
Somerset County				
Softwoods	7,522	36,575	552	44,649
Hardwoods	306	12,810	2,508	15,624
Total	7,828	49,385	3,060	60,273
Washington County				
Softwoods	10,704	6,707	1,328	18,739
Hardwoods	44	17,229	641	17,914
Total	10,748	23,936	1,969	36,653
Western Maine				
Softwoods	15,029	23,570	70	38,669
Hardwoods	2,903	23,384	5,062	31,349
Total	17,932	46,954	5,132	70,018
All units				
Softwoods	117,007	186,879	6,520	310,406
Hardwoods	9,581	103,616	15,079	128,276
Total	126,588	290,495	21,599	438,682

(Table 4—cont.)

Geographic unit and species group	Sawlogs	Pulpwood	Other products ^b	All products
<i>Thousand m³</i>				
Aroostook County				
Softwoods	1,163.2	1,198.3	87.3	2,448.8
Hardwoods	75.7	248.0	37.8	361.5
Total	1,238.9	1,446.3	125.1	2,810.3
Capital Region				
Softwoods	158.7	369.0	4.0	531.7
Hardwoods	35.4	155.3	27.7	218.4
Total	194.1	524.3	31.7	750.1
Casco Bay				
Softwoods	308.8	196.2	1.8	506.8
Hardwoods	24.1	82.8	30.5	137.4
Total	332.9	279.0	32.3	644.2
Hancock County				
Softwoods	162.6	98.7	2.6	263.9
Hardwoods	1.8	92.4	8.7	102.9
Total	164.4	191.1	11.3	366.8
Penobscot County				
Softwoods	265.3	549.6	28.8	843.7
Hardwoods	8.8	415.0	53.4	477.2
Total	274.1	964.6	82.2	1,320.9
Piscataquis County				
Softwoods	313.4	987.5	4.8	1,305.7
Hardwoods	33.4	428.0	36.4	497.8
Total	346.8	1,415.5	41.2	1,803.5
Somerset County				
Softwoods	213.0	1,035.9	15.6	1,264.5
Hardwoods	8.7	362.8	71.1	442.6
Total	221.7	1,398.7	86.7	1,707.1
Washington County				
Softwoods	303.2	189.9	37.6	530.7
Hardwoods	1.2	488.0	18.2	507.4
Total	304.4	677.9	55.8	1,038.1
Western Maine				
Softwoods	425.6	667.6	2.0	1,095.2
Hardwoods	82.3	662.3	143.3	887.9
Total	507.9	1,329.9	145.3	1,983.1
All units				
Softwoods	3,313.8	5,292.7	184.5	8,791.0
Hardwoods	271.4	2,934.6	427.1	3,663.1
Total	3,585.2	8,227.3	611.6	12,424.1

^aDoes not include fuelwood or removals that were not manufactured into industrial products.

^bIncludes cabin, cooperage and veneer logs, turnery bolts, poles, piling, and stock for bowls, clothespins, fencing, shingles, ties, miscellaneous dimension, and numerous other products.

Table 5.—Number of operating sawmills, by geographic unit and annual production class, Maine, 1981

Geographic unit	Production class ^a					Total
	More than 10 million board feet	Between 5–10 million board feet	Between 1–5 million board feet	Between 10,000 and 1 million board feet	Custom mills	
Aroostook County	4	1	2	14	15	36
Capital Region	1	2	2	21	65	91
Casco Bay	2	1	10	26	52	91
Hancock County	—	—	1	5	12	18
Penobscot County	2	2	6	6	15	31
Piscataquis County	1	—	4	5	12	22
Somerset County	2	—	1	6	10	19
Washington County	1	—	—	5	8	14
Western Maine	2	4	13	7	20	46
All units	15	10	39	95	209	368

^aBased on sawlog receipts.**Table 6.—Sawlog^a production and receipts relationships,
by geographic unit, Maine, 1981
(In millions of board feet)^b**

Geographic unit	Production	Receipts	Net export(+) import(–)
Aroostook County	274.1	164.0	110.1
Capital Region	43.2	43.0	.2
Casco Bay	73.7	71.9	1.8
Hancock County	36.3	6.4	29.9
Penobscot County	60.6	164.6	–104.0
Piscataquis County	76.8	24.0	52.8
Somerset County	49.0	36.0	13.0
Washington County	67.2	55.8	11.4
Western Maine	112.9	107.6	5.3
All units	793.8	673.3	120.5

^aIncludes boltwood sawn into lumber and lobster-trap stock.^bInternational ¼-inch rule.

**Table 7.—Sawlog^a production, by softwoods and hardwoods,
geographic unit and destination of shipment,
Maine 1981
(In millions of board feet)^b**

Species group and geographic unit	Retained in unit	Logs shipped to:		Total production
		Other units	Other states	
Softwoods				
Aroostook County	125.2	35.2	96.1	256.5
Capital Region	28.7	6.3	*	35.0
Casco Bay	42.7	25.3	.1	68.1
Hancock County	4.2	31.7	—	35.9
Penobscot County	43.0	14.9	.6	58.5
Piscataquis County	16.9	38.9	13.3	69.1
Somerset County	22.9	6.6	17.5	47.0
Washington County	25.5	41.4	—	66.9
Western Maine	59.7	17.5	16.7	93.9
Total softwoods	368.8	217.8	144.3	730.9
Hardwoods				
Aroostook County	3.0	0.2	14.4	17.6
Capital Region	7.0	1.2	—	8.2
Casco Bay	3.2	2.1	.3	5.6
Hancock County	.1	.3	—	.4
Penobscot County	1.7	.4	—	2.1
Piscataquis County	6.9	*	.8	7.7
Somerset County	.1	1.2	.7	2.0
Washington County	.1	.2	—	.3
Western Maine	16.1	2.9	—	19.0
Total hardwoods	38.2	8.5	16.2	62.9
All species	407.0	226.3	160.5	793.8

^aIncludes boltwood sawn into lumber and lobster-trap stock.

^bInternational 1/4-inch rule.

*Less than 50,000 board feet.

**Table 8.—Sawlog^a receipts, by softwoods and hardwoods,
geographic unit, and origin of shipment,
Maine, 1981
(In millions of board feet)^b**

Species group and geographic unit	Where produced			Total receipts
	In unit	In state	In other states	
Softwoods				
Aroostook County	125.2	34.4	1.2	160.8
Capital Region	28.7	6.2	.5	35.4
Casco Bay	42.7	16.1	6.3	65.1
Hancock County	4.2	2.0	—	6.2
Penobscot County	43.0	118.5	.8	162.3
Piscataquis County	16.9	.2	—	17.1
Somerset County	22.9	13.0	—	35.9
Washington County	25.5	4.4	25.8	55.7
Western Maine	59.7	23.0	4.3	87.0
Total softwoods	368.8	217.8	38.9	625.5
Hardwoods				
Aroostook County	3.0	0.2	—	3.2
Capital Region	7.0	.6	—	7.6
Casco Bay	3.2	3.6	—	6.8
Hancock County	.1	.1	—	.2
Penobscot County	1.7	.6	—	2.3
Piscataquis County	6.9	—	—	6.9
Somerset County	.1	*	—	.1
Washington County	.1	*	—	.1
Western Maine	16.1	3.4	1.1	20.6
Total hardwoods	38.2	8.5	1.1	47.8
All species	407.0	226.3	40.0	673.3

^aIncludes boltwood sawn into lumber and lobster-trap stock.

^bInternational ¼-inch rule.

*Less than 50,000 board feet.

Table 9.—Sawlog^a production and receipts in the Aroostook County Unit, by species, and destination and origin of shipment, Maine, 1981 (In millions of board feet)^b

Species	Cut and retained in unit	Out-shipsments		Total production	In-shipsments		Total receipts
		To other units	To other states ^c		From other units	From other states	
Balsam fir	37.1	11.2	41.9	90.2	1.9	0.4	39.4
Hemlock	1.2	2.3	.1	3.6	.7	—	1.9
White pine	2.9	.4	.8	4.1	2.5	—	5.4
Spruce	82.6	21.2	51.7	155.5	29.2	.7	112.5
Other softwoods ^d	1.4	.1	1.6	3.1	.1	.1	1.6
Total softwoods	125.2	35.2	96.1	256.5	34.4	1.2	160.8
Ash	0.8	*	0.1	0.9	—	—	0.8
Aspen	.2	—	.7	.9	—	—	.2
Beech	.1	—	2.4	2.5	*	—	.1
Yellow birch	.4	*	1.2	1.6	—	—	.4
Hard maple	1.3	0.1	8.7	10.1	*	—	1.3
Other hardwoods ^e	.2	.1	1.3	1.6	0.2	—	.4
Total hardwoods	3.0	0.2	14.4	17.6	0.2	—	3.2
All species	128.2	35.4	110.5	274.1	34.6	1.2	164.0

^aIncludes boltwood sawn into lumber and lobster-trap stock.

^bInternational ¼-inch rule.

^cIncludes Connecticut, Massachusetts, New Hampshire, New York, Vermont, and Canada.

^dIncludes cedar, pitch and red pine, and tamarack.

^eIncludes white birch, soft maple, red oak, elm, balsam poplar, and other less significant species.

*Less than 50,000 board feet.

Table 10.—Sawlog^a production and receipts in the Capital Region Unit, by species, and destination and origin of shipment, Maine, 1981 (In millions of board feet)^b

Species	Cut and retained in unit	Out-shipsments		Total production	In-shipsments		Total receipts
		To other units	To other states ^c		From other units	From other states	
Balsam fir	*	*	—	*	—	—	*
Hemlock	3.2	1.0	—	4.2	1.1	—	4.3
White pine	23.2	4.7	—	27.9	4.4	0.5	28.1
Spruce	2.1	.5	*	2.6	.7	—	2.8
Other softwoods ^d	.2	.1	—	.3	*	—	.2
Total softwoods	28.7	6.3	*	35.0	6.2	0.5	35.4
Ash	0.2	*	—	0.2	0.1	—	0.3
Aspen	.1	0.2	—	.3	*	—	.1
Beech	.6	.1	—	.7	.2	—	.8
Yellow birch	.1	*	—	.1	—	—	.1
Hard maple	.1	.2	—	.3	.1	—	.2
Other hardwoods ^e	5.9	.7	—	6.6	.2	—	6.1
Total hardwoods	7.0	1.2	—	8.2	0.6	—	7.6
All species	35.7	7.5	*	43.2	6.8	0.5	43.0

^aIncludes boltwood sawn into lumber and lobster-trap stock.

^bInternational ¼-inch rule.

^cIncludes Connecticut, Massachusetts, New Hampshire, New York, Vermont, and Canada.

^dIncludes cedar, pitch and red pine, and tamarack.

^eIncludes white birch, soft maple, red oak, elm, balsam poplar, and other less significant species.

*Less than 50,000 board feet.

**Table 11.—Sawlog^a production and receipts in the Casco Bay Unit, by species, and destination and origin of shipment, Maine, 1981
(In millions of board feet)^b**

Species	Cut and retained in unit	Out-shipments		Total production	In-shipments		Total receipts
		To other units	To other states ^c		From other units	From other states	
Balsam fir	2.1	*	—	2.1	0.9	—	3.0
Hemlock	15.9	3.0	*	18.9	6.4	0.2	22.5
White pine	23.0	20.4	0.1	43.5	4.0	6.1	33.1
Spruce	1.5	1.4	—	2.9	4.7	—	6.2
Other softwoods ^d	.2	.5	*	.7	.1	—	.3
Total softwoods	42.7	25.3	0.1	68.1	16.1	6.3	65.1
Ash	*	0.1	—	0.1	*	—	*
Aspen	0.1	*	—	.1	0.6	—	0.7
Beech	.1	*	*	.1	.5	—	.6
Yellow birch	.1	.1	0.3	.5	—	—	.1
Hard maple	.3	.2	*	.5	1.7	—	2.0
Other hardwoods ^e	2.6	1.7	—	4.3	.8	—	3.4
Total hardwoods	3.2	2.1	0.3	5.6	3.6	—	6.8
All species	45.9	27.4	0.4	73.7	19.7	6.3	71.9

^aIncludes boltwood sawn into lumber and lobster-trap stock.

^bInternational ¼-inch rule.

^cIncludes Connecticut, Massachusetts, New Hampshire, New York, Vermont, and Canada.

^dIncludes cedar, pitch and red pine, and tamarack.

^eIncludes white birch, soft maple, red oak, elm, balsam poplar, and other less significant species.

*Less than 50,000 board feet.

**Table 12.—Sawlog^a production and receipts in the Hancock County Unit, by species, and destination and origin of shipment, Maine, 1981
(In millions of board feet)^b**

Species	Cut and retained in unit	Out-shipments		Total production	In-shipments		Total receipts
		To other units	To other states ^c		From other units	From other states	
Balsam fir	0.1	1.9	—	2.0	—	—	0.1
Hemlock	.2	5.6	—	5.8	*	—	.2
White pine	2.5	3.7	—	6.2	1.6	—	4.1
Spruce	1.2	16.1	—	17.3	.3	—	1.5
Other softwoods ^d	.2	4.4	—	4.6	.1	—	.3
Total softwoods	4.2	31.7	—	35.9	2.0	—	6.2
Ash	*	0.1	—	0.1	—	—	*
Aspen	—	—	—	—	—	—	—
Beech	*	*	—	*	—	—	*
Yellow birch	*	*	—	*	—	—	*
Hard maple	*	.1	—	.1	—	—	*
Other hardwoods ^e	0.1	.1	—	.2	0.1	—	0.2
Total hardwoods	0.1	0.3	—	0.4	0.1	—	0.2
All species	4.3	32.0	—	36.3	2.1	—	6.4

^aIncludes boltwood sawn into lumber and lobster-trap stock.

^bInternational ¼-inch rule.

^cIncludes Connecticut, Massachusetts, New Hampshire, New York, Vermont, and Canada.

^dIncludes cedar, pitch and red pine, and tamarack.

^eIncludes white birch, soft maple, red oak, elm, balsam poplar, and other less significant species.

*Less than 50,000 board feet.

Table 13.—Sawlog^a production and receipts in the Penobscot County Unit, by species, and destination and origin of shipment, Maine, 1981 (In millions of board feet)^b

Species	Cut and retained in unit	Out-shipments		Total production	In-shipments		Total receipts
		To other units	To other states ^c		From other units	From other states	
Balsam fir	3.9	1.0	0.6	5.5	21.0	—	24.9
Hemlock	10.2	.7	—	10.9	18.3	—	28.5
White pine	18.3	1.5	—	19.8	12.8	0.8	31.9
Spruce	10.1	11.6	—	21.7	60.3	—	70.4
Other softwoods ^d	.5	.1	—	.6	6.1	—	6.6
Total softwoods	43.0	14.9	0.6	58.5	118.5	0.8	162.3
Ash	0.2	—	—	0.2	0.1	—	0.3
Aspen	.3	—	—	.3	*	—	.3
Beech	.1	*	—	.1	*	—	.1
Yellow birch	.2	—	—	.2	.1	—	.3
Hard maple	.7	0.1	—	.8	.2	—	.9
Other hardwoods ^e	.2	.3	—	.5	.2	—	.4
Total hardwoods	1.7	0.4	—	2.1	0.6	—	2.3
All species	44.7	15.3	0.6	60.6	119.1	0.8	164.6

^aIncludes boltwood sawn into lumber and lobster-trap stock.

^bInternational ¼-inch rule.

^cIncludes Connecticut, Massachusetts, New Hampshire, New York, Vermont, and Canada.

^dIncludes cedar, pitch and red pine, and tamarack.

^eIncludes white birch, soft maple, red oak, elm, balsam poplar, and other less significant species.

*Less than 50,000 board feet.

Table 14.—Sawlog^a production and receipts in the Piscataquis County Unit, by species, and destination and origin of shipment, Maine, 1981 (In millions of board feet)^b

Species	Cut and retained in unit	Out-shipments		Total production	In-shipments		Total receipts
		To other units	To other states ^c		From other units	From other states	
Balsam fir	5.3	6.3	0.8	12.4	—	—	5.3
Hemlock	.4	2.2	—	2.6	—	—	.4
White pine	.1	3.6	.3	4.0	—	—	.1
Spruce	10.6	26.8	12.2	49.6	*	—	10.6
Other softwoods ^d	.5	—	—	.5	0.2	—	.7
Total softwoods	16.9	38.9	13.3	69.1	0.2	—	17.1
Ash	0.3	—	—	0.3	—	—	0.3
Aspen	.4	—	0.1	.5	—	—	.4
Beech	.4	—	—	.4	—	—	.4
Yellow birch	.6	—	*	.6	—	—	.6
Hard maple	3.2	—	—	3.2	—	—	3.2
Other hardwoods ^e	2.0	*	.7	2.7	—	—	2.0
Total hardwoods	6.9	*	0.8	7.7	—	—	6.9
All species	23.8	38.9	14.1	76.8	0.2	—	24.0

^aIncludes boltwood sawn into lumber and lobster-trap stock.

^bInternational ¼-inch rule.

^cIncludes Connecticut, Massachusetts, New Hampshire, New York, Vermont, and Canada.

^dIncludes cedar, pitch and red pine, and tamarack.

^eIncludes white birch, soft maple, red oak, elm, balsam poplar, and other less significant species.

*Less than 50,000 board feet.

Table 15.—Sawlog^a production and receipts in the Somerset County Unit, by species, and destination and origin of shipment, Maine, 1981 (In millions of board feet)^b

Species	Cut and retained in unit	Out-shipments		Total production	In-shipments		Total receipts
		To other units	To other states ^c		From other units	From other states	
Balsam fir	2.4	0.5	1.2	4.1	—	—	2.4
Hemlock	.4	.6	—	1.0	*	—	.4
White pine	7.8	2.1	.5	10.4	10.2	—	18.0
Spruce	11.6	3.1	15.7	30.4	2.2	—	13.8
Other softwoods ^d	.7	.3	.1	1.1	.6	—	1.3
Total softwoods	22.9	6.6	17.5	47.0	13.0	—	35.9
Ash	*	0.1	—	0.1	—	—	*
Aspen	*	*	0.1	.1	—	—	*
Beech	*	.1	—	.1	—	—	*
Yellow birch	*	.1	—	.1	—	—	*
Hard maple	*	.1	—	.1	—	—	*
Other hardwoods ^e	0.1	.8	.6	1.5	*	—	0.1
Total hardwoods	0.1	1.2	0.7	2.0	*	—	0.1
All species	23.0	7.8	18.2	49.0	13.0	—	36.0

^aIncludes boltwood sawn into lumber and lobster-trap stock.

^bInternational ¼-inch rule.

^cIncludes Connecticut, Massachusetts, New Hampshire, New York, Vermont, and Canada.

^dIncludes cedar, pitch and red pine, and tamarack.

^eIncludes white birch, soft maple, red oak, elm, balsam poplar, and other less significant species.

*Less than 50,000 board feet.

Table 16.—Sawlog^a production and receipts in the Washington County Unit, by species, and destination and origin of shipment, Maine, 1981 (In millions of board feet)^b

Species	Cut and retained in unit	Out-shipments		Total production	In-shipments		Total receipts
		To other units	To other states ^c		From other units	From other states	
Balsam fir	1.0	2.1	—	3.1	0.2	2.1	3.3
Hemlock	2.1	8.3	—	10.4	*	2.1	4.2
White pine	.8	11.0	—	11.8	.2	.5	1.5
Spruce	21.3	18.0	—	39.3	3.7	18.9	43.9
Other softwoods ^d	.3	2.0	—	2.3	.3	2.2	2.8
Total softwoods	25.5	41.4	—	66.9	4.4	25.8	55.7
Ash	*	0.1	—	0.1	—	—	*
Aspen	*	—	—	*	—	—	*
Beech	*	—	—	*	—	—	*
Yellow birch	*	*	—	*	—	—	*
Hard maple	*	.1	—	.1	—	—	*
Other hardwoods ^e	0.1	*	—	.1	*	—	0.1
Total hardwoods	0.1	0.2	—	0.3	*	—	0.1
All species	25.6	41.6	—	67.2	4.4	25.8	55.8

^aIncludes boltwood sawn into lumber and lobster-trap stock.

^bInternational ¼-inch rule.

^cIncludes Connecticut, Massachusetts, New Hampshire, New York, Vermont, and Canada.

^dIncludes cedar, pitch and red pine, and tamarack.

^eIncludes white birch, soft maple, red oak, elm, balsam poplar, and other less significant species.

*Less than 50,000 board feet.

Table 17.—Sawlog^a production and receipts in the Western Maine Unit, by species, and destination and origin of shipment, Maine, 1981 (In millions of board feet)^b

Species	Cut and retained in unit	Out-shipments		Total production	In-shipments		Total receipts
		To other units	To other states ^c		From other units	From other states	
Balsam fir	11.5	1.0	11.2	23.7	*	—	11.5
Hemlock	3.6	5.6	—	9.2	2.8	*	6.4
White pine	42.4	8.2	.1	50.7	19.9	4.3	66.6
Spruce	1.7	2.6	5.4	9.7	.2	*	1.9
Other softwoods ^d	.5	.1	*	.6	.1	—	.6
Total softwoods	59.7	17.5	16.7	93.9	23.0	4.3	87.0
Ash	1.3	*	—	1.3	0.2	*	1.5
Aspen	.2	.4	—	.6	*	—	.2
Beech	.2	.5	—	.7	*	—	.2
Yellow birch	1.7	—	—	1.7	.1	*	1.8
Hard maple	4.4	1.6	—	6.0	.5	.8	5.7
Other hardwoods ^e	8.3	.4	—	8.7	2.6	.3	11.2
Total hardwoods	16.1	2.9	—	19.0	3.4	1.1	20.6
All species	75.8	20.4	16.7	112.9	26.4	5.4	107.6

^aIncludes boltwood sawn into lumber and lobster-trap stock.

^bInternational ¼-inch rule.

^cIncludes Connecticut, Massachusetts, New Hampshire, New York, Vermont, and Canada.

^dIncludes cedar, pitch and red pine, and tamarack.

^eIncludes white birch, soft maple, red oak, elm, balsam poplar, and other less significant species.

*Less than 50,000 board feet.

Table 18.—Sawlog^a production and receipts, by species, and destination and origin of shipment, Maine, 1981 (In millions of board feet)^b

Species	Cut and retained in state	Exported to:			Total production	Imported from:			Total receipts
		Other states ^c	New Brunswick ^d	Quebec		Other states ^c	New Brunswick	Quebec	
Balsam fir	87.4	5.0	9.2	41.5	143.1	—	2.3	0.2	89.9
Hemlock	66.5	—	.1	—	66.6	0.2	2.1	—	68.8
White pine	176.6	.2	.6	1.0	178.4	11.6	.6	—	188.8
Spruce	244.0	4.0	9.2	71.8	329.0	*	19.3	.3	263.6
Other softwoods ^e	12.1	—	*	1.7	13.8	.1	2.2	—	14.4
Total softwoods	586.6	9.2	19.1	116.0	730.9	11.9	26.5	0.5	625.5
Ash	3.2	—	0.1	—	3.3	*	—	—	3.2
Aspen	1.9	0.1	.6	0.2	2.8	—	—	—	1.9
Beech	2.2	—	2.4	*	4.6	—	—	—	2.2
Yellow Birch	3.3	—	1.1	.4	4.8	*	—	—	3.3
Hard maple	12.5	—	8.2	.5	21.2	0.8	—	—	13.3
Other hardwoods ^f	23.6	—	1.2	1.4	26.2	.3	—	—	23.9
Total hardwoods	46.7	0.1	13.6	2.5	62.9	1.1	—	—	47.8
All species	633.3	9.3	32.7	118.5	793.8	13.0	26.5	0.5	673.3

^aIncludes boltwood sawn into lumber and lobster-trap stock.

^bInternational ¼-inch rule.

^cIncludes Connecticut, Massachusetts, New Hampshire, New York, and Vermont.

^dIncludes 162,000 board feet white and yellow birch received in Ontario.

^eIncludes cedar, pitch and red pine, and tamarack.

^fIncludes white birch, soft maple, red oak, elm, balsam poplar, and other less significant species.

*Less than 50,000 board feet.

Table 19.—Pulpwood production, by softwoods and hardwoods, Maine, 1967–81^a
(In thousands of rough cords)

Year	All species	Softwoods	Hardwoods
1967	2,947.4	2,246.2	701.2
1968	3,008.6	2,331.8	676.8
1969	2,909.2	2,082.6	826.6
1970	3,469.0	2,508.1	960.9
1971	3,097.0	2,194.7	902.3
5-year total	15,431.2	11,363.4	4,067.8
1972	2,694.5	1,852.0	842.5
1973	3,455.2	2,376.8	1,078.4
1974	3,721.0	2,562.9	1,158.1
1975	2,866.8	2,030.9	835.9
1976	3,286.6	2,306.9	979.7
5-year total	16,024.1	11,129.5	4,894.6
1977	3,710.2	2,753.6	956.6
1978	3,955.0	2,844.8	1,110.2
1979	3,958.6	2,733.9	1,224.7
1980	4,220.9	2,969.2	1,251.7
1981	4,255.0	2,953.4	1,301.6
5-year total	20,099.7	14,254.9	5,844.8

^aIncludes production from both roundwood and chips from manufacturing residues.

Table 20.—Pulpwood harvest, by softwoods and hardwoods, and geographic unit, Maine, 1967–81
(In thousands of rough cords)

Species group and geographic unit	1967	1968	1969	1970	1971	1972	1973	1974
Softwoods								
Aroostook County	495.2	480.2	450.3	637.1	528.8	428.4	565.9	544.7
Capital Region	153.0	132.6	118.5	129.7	126.3	100.9	81.7	117.0
Casco Bay	73.5	66.9	64.1	69.8	66.5	71.3	67.4	78.0
Hancock County	60.8	50.9	49.6	68.8	55.4	46.3	49.7	64.8
Penobscot County	281.0	260.0	241.0	328.2	284.7	262.4	230.6	264.5
Piscataquis County	346.9	392.2	266.9	367.6	340.3	201.6	442.3	455.2
Somerset County	365.6	295.8	314.5	303.2	217.9	181.9	376.4	395.1
Washington County	218.3	315.4	243.9	259.2	244.9	221.7	236.9	266.7
Western Maine	173.4	158.3	141.5	156.6	130.1	119.8	94.8	121.7
Total softwoods	2,167.7	2,152.3	1,890.3	2,320.2	1,994.9	1,634.3	2,145.7	2,307.7
Hardwoods								
Aroostook County	66.5	55.9	72.2	69.1	74.5	75.3	83.9	133.9
Capital Region	86.4	84.5	75.3	86.5	73.7	75.4	75.2	79.6
Casco Bay	69.2	69.8	70.1	69.2	55.4	56.9	91.9	62.7
Hancock County	25.0	4.7	15.5	17.0	22.1	18.2	33.5	20.5
Penobscot County	109.5	115.4	149.6	147.5	137.3	127.3	147.4	133.1
Piscataquis County	52.0	47.2	49.0	80.6	81.6	65.8	90.0	102.0
Somerset County	56.8	38.2	71.1	67.5	82.7	61.7	125.2	117.4
Washington County	31.1	24.0	78.9	101.3	86.9	79.1	134.2	169.4
Western Maine	179.4	206.5	196.2	262.0	227.8	210.1	213.7	258.1
Total hardwoods	675.9	646.2	777.9	900.7	842.0	769.8	995.0	1,076.7
All species	2,843.6	2,798.5	2,668.2	3,220.9	2,836.9	2,404.1	3,140.7	3,384.4
	1975	1976	1977	1978	1979	1980	1981	All Years
Softwoods								
Aroostook County	299.6	448.4	520.6	551.3	505.1	608.1	497.8	7,561.5
Capital Region	93.1	125.9	111.6	159.6	129.4	163.2	153.3	1,895.8
Casco Bay	72.7	81.4	71.1	83.6	80.1	96.4	81.5	1,124.3
Hancock County	35.5	38.7	32.0	45.6	36.6	29.4	41.0	705.1
Penobscot County	215.8	197.9	160.4	202.5	221.8	228.8	228.3	3,607.9
Piscataquis County	370.5	338.9	373.7	442.8	428.3	467.0	410.2	5,644.4
Somerset County	279.5	292.7	388.6	364.5	356.1	414.0	430.3	4,976.1
Washington County	242.8	212.0	170.4	145.4	126.5	97.1	78.9	3,080.1
Western Maine	129.0	153.5	144.4	163.1	188.4	200.6	277.3	2,352.5
Total softwoods	1,738.5	1,889.4	1,972.8	2,158.4	2,072.3	2,304.6	2,198.6	30,947.7
Hardwoods								
Aroostook County	69.5	118.7	105.5	100.0	110.4	84.7	103.0	1,323.1
Capital Region	57.2	67.3	62.1	73.5	69.9	71.1	64.5	1,102.2
Casco Bay	39.7	55.0	40.7	45.9	39.3	38.9	34.4	839.1
Hancock County	20.3	18.6	16.7	27.2	46.8	35.4	38.4	359.9
Penobscot County	97.7	90.8	70.6	83.0	117.0	110.3	172.4	1,808.9
Piscataquis County	81.2	92.8	119.9	139.0	152.4	163.0	177.8	1,494.3
Somerset County	51.5	66.1	51.3	89.7	121.0	114.0	150.7	1,264.9
Washington County	123.0	141.1	117.2	185.4	189.4	268.6	202.7	1,932.3
Western Maine	213.3	262.7	253.4	282.7	259.4	257.4	275.1	3,557.8
Total hardwoods	753.4	913.1	837.4	1,026.4	1,105.6	1,143.4	1,219.0	13,682.5
All species	2,491.9	2,802.5	2,810.2	3,184.8	3,177.9	3,448.0	3,417.6	44,630.2

**Table 21.—Veneer log production^a in Maine, by species and consuming state, 1981
(In thousands of board feet)^b**

Species	Cut and retained in state	Exported to:			Total production
		Vermont	New Brunswick	Quebec	
Cedar	—	—	792	—	792
White pine	—	—	157	—	157
Spruce	—	—	7,167 ^c	—	7,167
Total softwoods	—	—	8,116	—	8,116
Ash	23	—	—	—	23
Aspen	—	—	16	1,242	1,258
Beech	124	—	—	4	128
White birch	21,820	61	16	462	22,359
Yellow birch	2,485	20	—	1,689	4,194
Hard maple	1,328	—	—	736	2,064
Soft maple	154	—	—	—	154
Red oak	—	102	33	—	135
Other hardwoods ^d	—	12	—	—	12
Total hardwoods	25,934	195	65	4,133	30,327
All species	25,934	195	8,181	4,133	38,443

^aVeneer logs handled by brokers for overseas shipment are not included.

^bInternational ¼-inch rule.

^cIncludes 2,000 board feet of tamarack.

^dIncludes miscellaneous hardwoods such as basswood and other less significant species.

**Table 22.—Veneer log receipts in Maine, by species and producing state, 1981
(In thousands of board feet)^a**

Species	Cut and retained in state	Imported from:					Total receipts
		New Hampshire	New York	Vermont	New Brunswick	Quebec	
Ash	23	—	—	—	—	—	23
Beech	124	—	—	—	—	—	124
White birch	21,820	1,176	20	321	1,143	769	25,249
Yellow birch	2,485	59	59	59	331	—	2,993
Hard maple	1,328	—	—	—	—	—	1,328
Soft maple	154	—	—	—	—	—	154
All species	25,934	1,235	79	380	1,474	769	29,871

^aInternational ¼-inch rule.

**Table 23.—Veneer log production^a
and receipts in Maine,
for selected years,
1963–81
(In thousands of board feet)^b**

Year	Production	Receipts
1963	51.3	42.9
1968	49.7	44.7
1972	38.0	41.0
1976	40.3	39.0
1980	39.9	27.0
1981	38.4	29.9

^aVeneer logs handled by brokers for overseas shipment are not included.

^bInternational ¼-inch rule.

**Table 24.—Production and disposition of manufacturing residues,
by type of use and type of residue, Maine, 1981**

Disposition	Type of residue			All types
	Bark	Coarse ^a	Fine ^b	
<i>(In thousands of ft³)</i> LUMBER ^c				
Fiber ^d	46	18,966	7,299	26,311
Agriculture ^e	1,400	9	4,250	5,659
Industrial fuel	9,250	2,035	4,207	15,492
Domestic fuel	328	798	10	1,136
Other ^f	1	1	254	256
Total, used	11,025	21,809	16,020	48,854
Unused	419	114	205	738
VENEER				
Fiber	—	209	—	209
Agriculture	—	—	—	—
Industrial fuel	577	567	1,503	2,647
Domestic fuel	2	35	—	37
Other	—	24	—	24
Total, used	579	835	1,503	2,917
Unused	5	—	66	71
OTHER INDUSTRIES ^g				
Fiber	—	1,935	309	2,244
Agriculture	86	10	867	963
Industrial fuel	1,276	1,328	1,826	4,430
Domestic fuel	187	627	101	915
Other	—	2	84	86
Total, used	1,549	3,902	3,187	8,638
Unused	171	286	214	671
ALL INDUSTRIES				
Fiber	46	21,110	7,608	28,764
Agriculture	1,486	19	5,117	6,622
Industrial fuel	11,103	3,930	7,536	22,569
Domestic fuel	517	1,460	111	2,088
Other	1	27	338	366
Total, used	13,153	26,546	20,710	60,409
Unused	595	400	485	1,480

Disposition	Type of residue			All types
	Bark	Coarse ^a	Fine ^b	
<i>(In thousands m³)</i> LUMBER ^c				
Fiber ^d	1.3	537.1	206.7	745.1
Agriculture ^e	39.6	.3	120.3	160.2
Industrial fuel	262.0	57.6	119.1	438.7
Domestic fuel	9.3	22.6	.3	32.2
Other ^f	*	*	7.2	7.2
Total, used	312.2	617.6	453.6	1,383.4
Unused	11.9	3.2	5.8	20.9
VENEER				
Fiber	—	5.9	—	5.9
Agriculture	—	—	—	—
Industrial fuel	16.3	16.0	42.6	74.9
Domestic fuel	.1	1.0	—	1.1
Other	—	.7	—	.7
Total, used	16.4	23.6	42.6	82.6
Unused	0.1	—	1.9	2.0
OTHER INDUSTRIES ^g				
Fiber	—	54.8	8.7	63.5
Agriculture	2.4	.3	24.6	27.3
Industrial fuel	36.1	37.6	51.7	125.4
Domestic fuel	5.3	17.7	2.9	25.9
Other	—	.1	2.3	2.4
Total, used	43.8	110.5	90.2	244.5
Unused	4.8	8.1	6.1	19.0
ALL INDUSTRIES				
Fiber	1.3	597.8	215.4	814.5
Agriculture	42.0	.6	144.9	187.5
Industrial fuel	314.4	111.2	213.4	639.0
Domestic fuel	14.7	41.3	3.2	59.2
Other	*	.8	9.5	10.3
Total, used	372.4	751.7	586.4	1,710.5
Unused	16.8	11.3	13.8	41.9

^aIncludes slabs, edgings, trimmings, veneer cores, and other material suitable for chipping.

^bIncludes sawdust, shavings, and other material considered unsuitable for chipping.

^cIncludes lumber products sawn from sawlogs and boltwood.

^dIncludes woodpulp and composite products.

^eIncludes livestock bedding and farm and horticultural mulch.

^fIncludes miscellaneous uses such as small dimension and speciality items.

^gIncludes cabin logs, cooperage logs and bolts, poles, piling, landscape and railroad ties, and stock for clothespins, miscellaneous dimension, shingles, tool handles and small poles, and numerous other items; excludes the woodpulp industry.

*Less than 50 m³.

Table 25.—Volume of unused sawmill residues,^a by geographic unit, softwoods and hardwoods, and type of residue, Maine, 1981

Geographic unit	Softwoods			Hardwoods			All species		
	Bark	Coarse	Fine	Bark	Coarse	Fine	Bark	Coarse	Fine
<i>Thousand ft³</i>									
Aroostook County	241	48	63	2	—	4	243	48	67
Capital Region	45	6	39	11	7	20	56	13	59
Casco Bay	23	22	29	2	1	17	25	23	46
Hancock County	2	6	18	—	—	7	2	6	25
Penobscot County	70	7	—	6	—	—	76	7	—
Piscataquis County	4	9	—	—	—	—	4	9	—
Somerset County	2	4	1	—	—	—	2	4	1
Washington County	2	2	—	1	2	—	3	4	—
Western Maine	8	—	4	—	—	3	8	—	7
Total	397	104	154	22	10	51	419	114	205
<i>Thousand m³</i>									
Aroostook County	6.8	1.3	1.8	0.1	—	0.1	6.9	1.3	1.9
Capital Region	1.3	.2	1.1	.3	0.2	.6	1.6	.4	1.7
Casco Bay	.6	.6	.8	*	.1	.5	.6	.7	1.3
Hancock County	.1	.2	.5	—	—	.2	.1	.2	.7
Penobscot County	2.0	.2	—	.2	—	—	2.2	.2	—
Piscataquis County	.1	.2	—	—	—	—	.1	.2	—
Somerset County	.1	.1	*	—	—	—	.1	.1	*
Washington County	.1	.1	—	*	*	—	.1	.1	—
Western Maine	.2	—	.1	—	—	.1	.2	—	.2
Total	11.3	2.9	4.3	0.6	0.3	1.5	11.9	3.2	5.8

^aIncludes residues from sawlogs and boltwood sawn into lumber products.

*Less than 100 m³.

Nevel, Robert L., Jr.; Lammert, Peter R.; Widmann, Richard H.
Maine timber industries—a periodic assessment of timber output. Resour. Bull. NE-83. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station; 1985. 42 p.

Reports the results of a survey of the timber industries in Maine; contains statistics on industrial timber production and receipts, and production and disposition of the manufacturing residues. Comparisons are made with the most recent data, and trends in industrial wood output are noted. Includes 25 statistical tables.

ODC 792:83(741)

Keywords: Timber output, wood residue use, Maine manufacturers, production statistics.

Headquarters of the Northeastern Forest Experiment Station are in Broomall, Pa. Field laboratories are maintained at:

- Amherst, Massachusetts, in cooperation with the University of Massachusetts.
 - Berea, Kentucky, in cooperation with Berea College.
 - Burlington, Vermont, in cooperation with the University of Vermont.
 - Delaware, Ohio.
 - Durham, New Hampshire, in cooperation with the University of New Hampshire.
 - Hamden, Connecticut, in cooperation with Yale University.
 - Morgantown, West Virginia, in cooperation with West Virginia University, Morgantown.
 - Orono, Maine, in cooperation with the University of Maine, Orono.
 - Parsons, West Virginia.
 - Princeton, West Virginia.
 - Syracuse, New York, in cooperation with the State University of New York College of Environmental Sciences and Forestry at Syracuse University, Syracuse.
 - University Park, Pennsylvania, in cooperation with the Pennsylvania State University.
 - Warren, Pennsylvania.
-